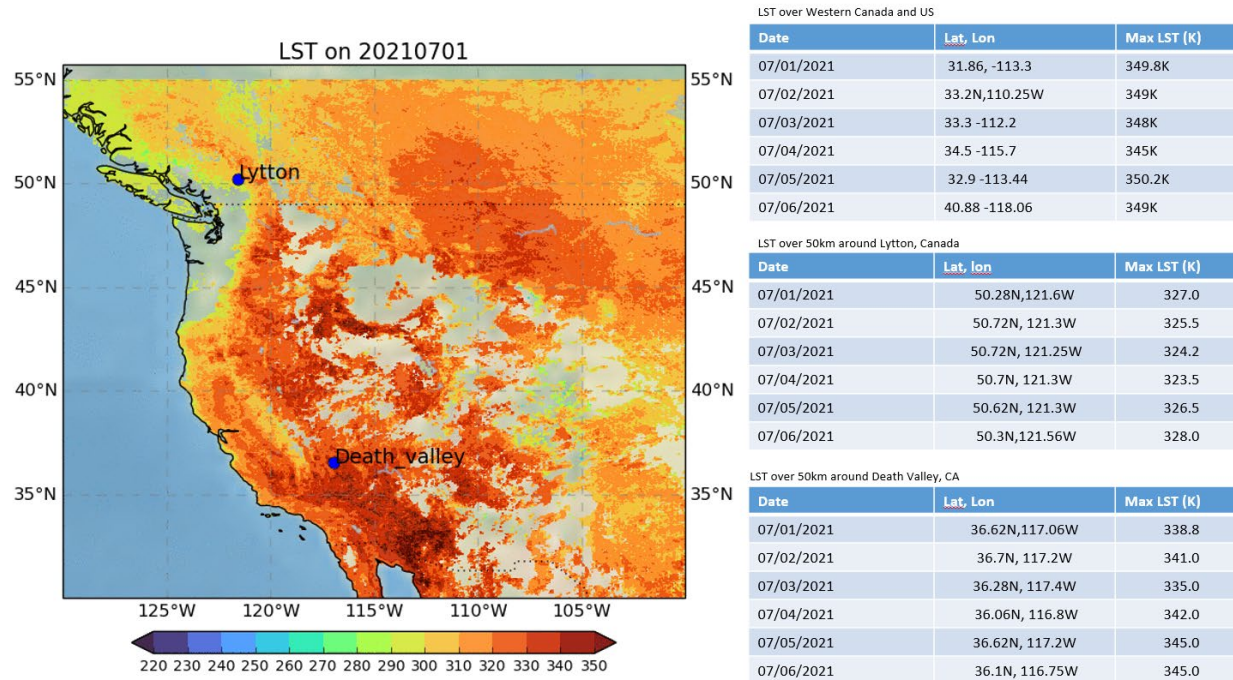# AMP/STAR
FY21 TTA

Lihang Zhou, DPMS Deputy
Bonnie Reed, Algorithm Sustainment Lead
Alisa Young, AMP Deputy for Science
& JPSS STAR Program Manager

August 13, 2021

Highlights from the Science Teams (July)

Heat wave observed in Western US

LST over Western Canada and US

Date	Lat, Lon	Max LST (K)
07/01/2021	31.86, -113.3	349.8K
07/02/2021	33.2N,110.25W	349K
07/03/2021	33.3 -112.2	348K
07/04/2021	34.5 -115.7	345K
07/05/2021	32.9 -113.44	350.2K
07/06/2021	40.88 -118.06	349K

LST over 50km around Lytton, Canada

Date	Lat, lon	Max LST (K)
07/01/2021	50.28N,121.6W	327.0
07/02/2021	50.72N, 121.3W	325.5
07/03/2021	50.72N, 121.25W	324.2
07/04/2021	50.7N, 121.3W	323.5
07/05/2021	50.62N, 121.3W	326.5
07/06/2021	50.3N,121.56W	328.0

LST over 50km around Death Valley, CA

Date	Lat, Lon	Max LST (K)
07/01/2021	36.62N,117.06W	338.8
07/02/2021	36.7N, 117.2W	341.0
07/03/2021	36.28N, 117.4W	335.0
07/04/2021	36.06N, 116.8W	342.0
07/05/2021	36.62N, 117.2W	345.0
07/06/2021	36.1N, 116.75W	345.0

Another intensive heat wave in western U.S. and southwest Canada in early July has been reported, in addition to the heat wave in the same area in June. Temperatures 20 degrees above normal were observed which could bring record-challenging heat to the west. There are two towns in particular were reported. Lytton, a small town in British Columbia, Canada, broke its nation's all-time temperature reading three days in a row as temperatures soared as high as 121 F degrees. Death Valley, a town in California, might spike to 130 F degrees.

CEOS Working Group on Disasters Wildfire Pilot stakeholder meeting

The CEOS Working Group on Disasters has recently started a new Wildfire Pilot with the overarching goal of providing a fundamental basis for defining global priorities for active-fire monitoring and characterization. On July 20, 2021 a virtual meeting was held to discuss the specifics of Pilot's objectives and stakeholders' potential contributions.. Further information on the Pilot, including the Implementation Plan, is available at https://ceos.org/ourwork/workinggroups/disasters/wildfire-pilot/ .

Update on the transition preparation of the reprocessed S-NPP/ATMS/CrIS/OMPS from STAR to CLASS

Instrument	Version	Start Time	End Time	Total Data Size (TB)	Completion Status
ATMS	V1	11/08/2011	03/08/2017	2.06	100%
ATMS	V2	11/08/2011	10/15/2019	3.07	100%
OMPS/TC	V1	01/30/2012	09/30/2018	6.80	100%
OMPS/NP	V1	01/25/2012	03/08/2017	0.41	100%
OMPS/TC	V2	01/30/2012	06/30/2021	9.60	90%
OMPS/NP	V2	01/25/2012	06/30/2021	0.72	1%
CrIS (NSR)	V2	02/20/2012	01/29/2020	75.61	86%
CrIS (FSR)	V2	12/04/2014	01/29/2020	92.31	79%

Transition of the reprocessed S-NPP SDR data to CLASS requires the data to be aggregated and compressed. In preparation for operational transition of such datasets, the reprocessing working group (RWG) post-processed the original reprocessed data following the requirements from CLASS. The post-processing, including modification of metadata, aggregation and compression of the data, has been carried out on the UMD/Bamboo cluster computing system. Then the ready-to-be-transitioned data are transferred to the STAR servers where the operational transition will be conducted. The readiness for the 07/30/21 week of the ready-to-be-transitioned S-NPP ATMS, OMPS, and CrIS data on STAR servers is summarized in the table below.

NOAA Microwave Sounder Workshop

MIRS N20/ATMS Temperature (K) at 700mb 2018-01-11 Des (V3783)
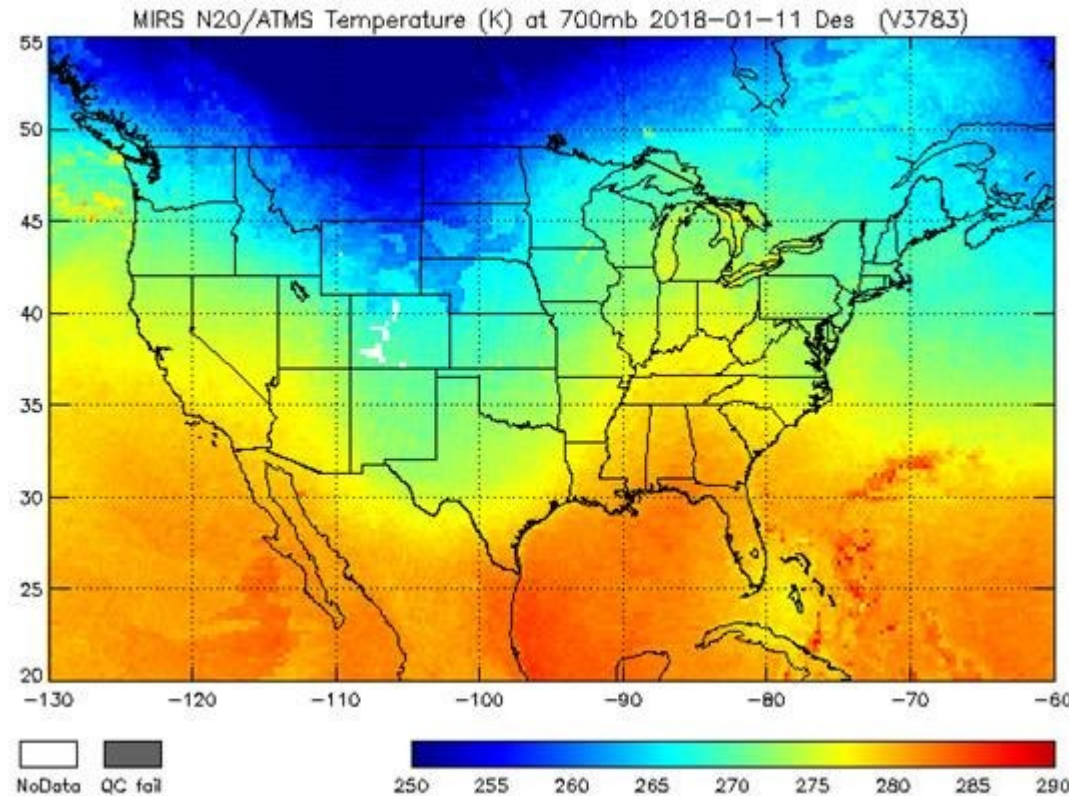
On July 28, 2021, NOAA Microwave Sounder Workshop was held virtually. The workshop aimed to overview microwave remote sensing for weather forecasting, climate studies and the environmental data records. Experts from worldwide numerical prediction centers overviewed satellite radiance assimilation in support of weather forecasting. The recommendations are crucial and very valuable to the architecture of future satellite observation systems. JPSS Chief Scientist Dr. Satya Kalluri presented NOAA Microwave Sounders for various cost categories. Kevin J. Garrett presented OSSE microwave radiance impact studies including CubeSAT TEMPEST-D microwave measurements. Mark Liu presented "Microwave Remote Sensings and Applications". He also discussed new opportunities using new frequencies at 424 GHz for temperature sounding and new frequencies at 325 GHz and 380 GHz for moisture sounding. The new water vapor channels can deliver water vapor information above 200 hPa.

Highlights from the Science Teams (July)

House Hearing on SPECTRUM NEEDS FOR OBSERVATIONS IN EARTH AND SPACE SCIENCES

On July 20, 2021, a Congressional hearing on hearing on "Spectrum Needs for Observations in Earth and Space Sciences". Mr. David Lubar, one of the five witnesses and a senior project lead of Aerospace Corporation, asked for inputs from ECMWF and NOAA/STAR on four questions below which were answered for NOAA by Drs. Changyong Cao and Mark Liu. The House Hearing video can be accessed from the YouTube https://www.youtube.com/watch?v=B5gIQNgOzEk .

Q: Why is 24 GHz important to NWP?

Q: Explain why 24 GHz matters over land where the 5G band will be used?

Q. What is being done to monitor and try to detect RFI in the 24 GHz band?

Q. Is the band more important for operational weather prediction or for climate science?

Highlights from the Science Teams (July)

Near Constant Contrast EDR now on SLIDER
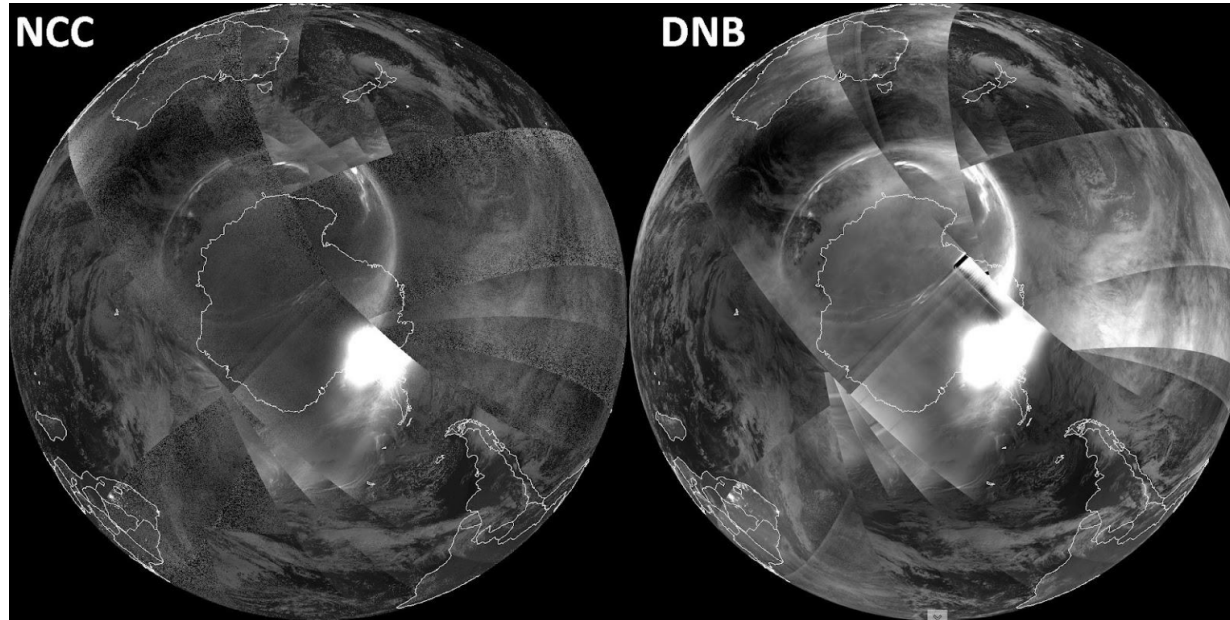
Figure: Near Constant Contrast (NCC, left) and Day/Night Band with ERF-scaling (DNB, right) as displayed on Polar SLIDER (18:10 UTC, 13 July 2021).

The VIIRS Near Constant Contrast (NCC) product is now available on CIRA's Polar SLIDER website (https://rammb-slider.cira.colostate.edu/?sat=jpss). This product is the operational VIIRS Imagery EDR designed to convert the Day/Night Band (DNB) radiance values into pseudo-reflectance (pseudo-albedo) values to facilitate ease of display of DNB data as imagery. On the product menu for Polar SLIDER, the NCC product is listed under "Day/Night Band (Near Constant Contrast)" to distinguish it from the alternative "ERF-scaling" algorithm developed at CIRA to display DNB imagery. The other primary difference between the NCC and DNB (ERF-scaling) products is that the NCC excludes the "extended granule" portion of the NOAA-20 VIIRS DNB swath, and thus excludes the stray light region associated with it. A sample comparison between the two is shown in the figure below.

Highlights from the Science Teams (July)

A Brief Investigation on Responses of Vegetation Index to Heat Wave in Western US/Canada
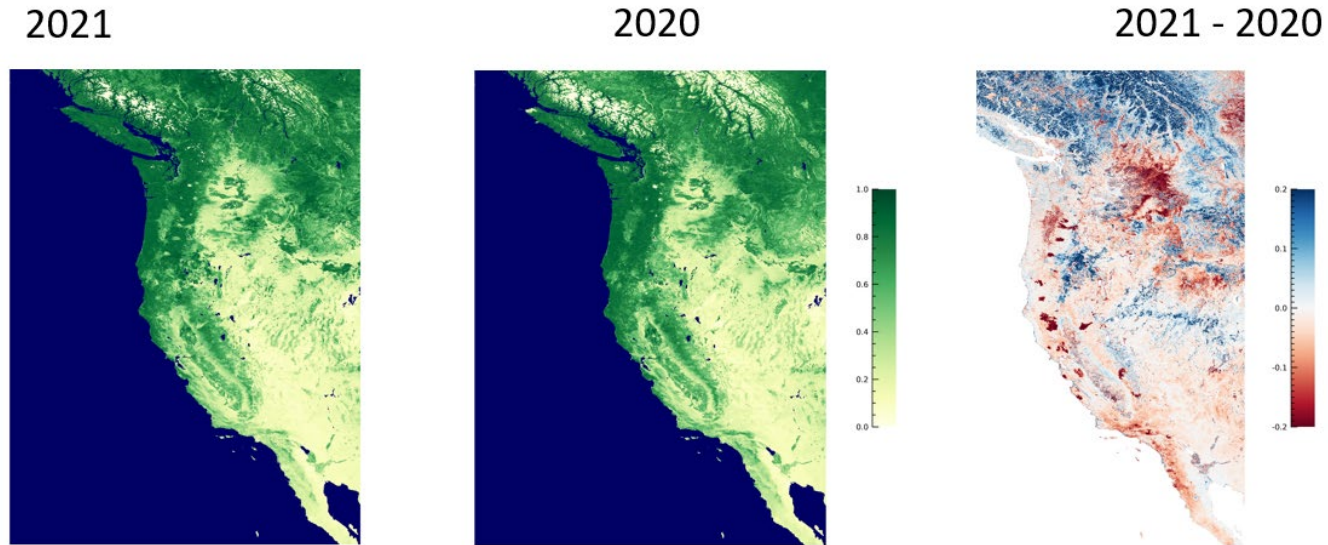
A significant heat wave event occurred in the western US/Canada in June, and was investigated using JPSS land surface temperature products. Are there any significant responses that can be observed from vegetation products such as the vegetation index (VI) and green vegetation (GVF) fraction? The JPSS VI and GVF science team has investigated on it, but there is no obvious decrease or increase signals were observed from the VI data neither the GVF data. In the investigation, the JPSS TOC (top of canopy) NDVI, EVI, and GVF were examined, comparing data from late June/ early July 2021 to the same dates in 2020. Some decrease in those vegetation parameters was seen in the western US, but vegetation indicators actually increased in western Canada. _It is unclear if the heat wave would have any significant impact on the vegetation parameters at this time_.

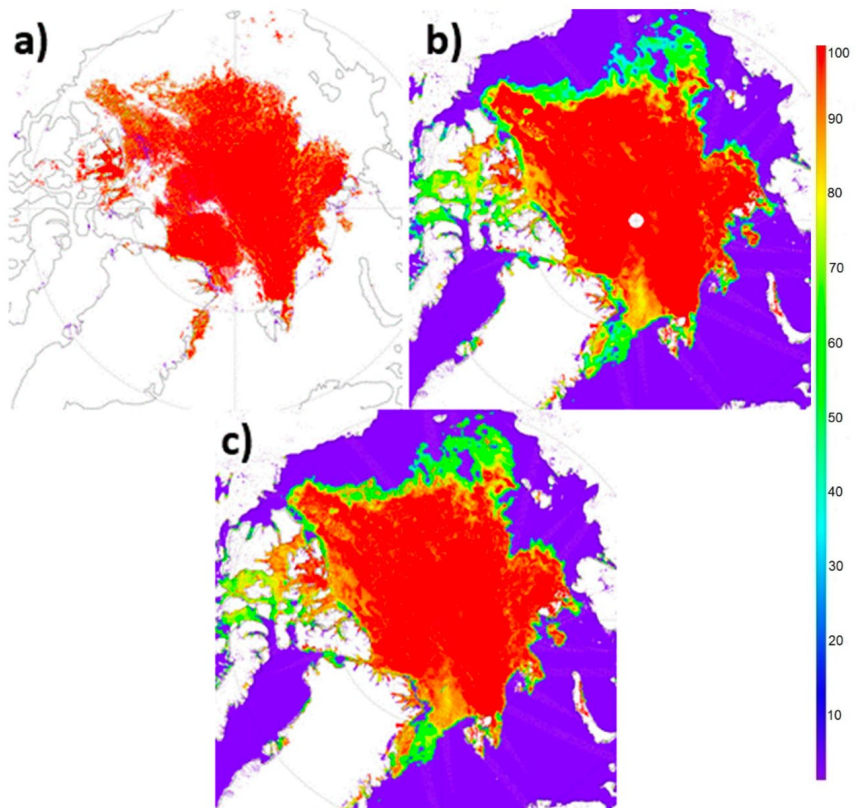**Paper published on a blended sea ice concentration product**

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

Blended Sea Ice Concentration Product from AMSR2 and VIIRS" has been published in the journal Remote Sensing as part of a special issue on Polar Sea Ice: Detection, Monitoring and Modeling (https://doi.org/10.3390/rs13152982). Authors are Rich Dworak (Cooperative Institute for Meteorological Satellite Studies), Yinghui Liu and Jeff Key (STAR), and Walt Meier (University of Colorado). Using AMSR2 and VIIRS sea sce concentration (SIC) algorithms, a blended SIC product has been developed using the Best Linear Unbiased Estimator (BLUE) approach. Case studies and a multi-year comparison to ice concentration derived from Landsat data shows that the blended SIC produces lower error statistics relative to the individual products. Furthermore, the VIIRS Ice Surface Temperature (IST) algorithm is utilized to detect ice in melting and near-melting environments and to include this information in the blending. The scientific findings in this paper are that in melting sea ice environments, AMSR2 produces lower SIC compared to VIIRS and Landsat, and that the VIIRS SIC can be utilized by the blending technique to correct the bias observed in AMSR2 SIC for clear-sky conditions.

VIIRS DNB observations of milky seas published in *Scientific Reports*

The paper titled, "Honing in on bioluminescent milky seas from space" was published in *Scientific Reports* on 29 July 2021. This paper discusses VIIRS DNB observations of 12 milky sea events. Milky seas are a rare phenomenon where the surface of the ocean appears to glow at night with the water taking on a milky appearance. Milky seas are a form of bioluminescence believed to be caused by the saprophytic relationship between a luminous bacteria and microalgae that occurs on a large scale. However, given the rare nature of these events, little *in situ* research has been performed. Now, researchers led by Steve Miller (CIRA) have searched exhaustively through the VIIRS Day/Night Band (DNB) record, dating back to 2012, and identified 12 milky sea events. It is hoped that, moving forward, routine inspection of DNB imagery in the regions where milky seas are most common can be coordinated with research vessels to directly observe a milky sea event as it occurs, thus answering many of the remaining scientific questions surrounding this mysterious phenomenon. This article is available at https://www.nature.com/articles/s41598-021-94823-z.

Accomplishments

- Delivery Algorithm Packages (DAPs) - Mission Unique Products:
  - 6/28/2021: STAR delivered VIIRS DAP (ADR-9599/CCR-5511, NOAA-20 VIIRS Post-VIGMU Geolocation LUTs Update) to DPMS
  - 7/07/2021: VIIRS SDR team delivered DAP (ADR9578/CCR5514, S-NPP VIIRS-RSBAUTOCAL-DNB-MOON-ILLUMINATION-LUT Update) to ASSISTT team (out-of-cycle LUT update). Following LUTs will be updated:
    - VIIRS-RSBAUTOCAL-DNB-MOON-ILLUMINATION-LUT
  - 7/23/2021: ASSISTT team delivered DAP (ADR9578/CCR5514) to DPMS

- DAPs – Enterprise Products:
  - 7/29/2021: Final CCAP for BUFR Toolkit (HEAP and MetOp-B/C Winds products) delivered to Cloud
  - 7/30/2021: Final Blended Hydro DAP delivered to NDE (Final Blended Hydro, with addition of MetOp-C)
  - 7/30/2021: MiRS v11.8 DAP delivered to ASSISTT/OSPO. The most significant updates are:
    - Updates to the snowfall rate (SFR) algorithm software including (1) final version ready for JPSS-2 processing, (2) machine learning based snowfall detection algorithms for NOAA-20 and SNPP, (3) new radiometric bias corrections for NOAA-20, S-NPP, NOAA-19, Metop-A, Metop-B, and Metop-C, (4) cloud temperature initialization for NOAA-20, S-NPP, NOAA-19, Metop-A, Metop-B, and Metop-C, (5) machine learning ice water path initialization for NOAA-20, S-NPP, NOAA-19, Metop-A, Metop-B, and Metop-C over CONUS, and (6) machine learning SFR bias correction for NOAA-20, S-NPP, NOAA-19, Metop-A, Metop-B, and Metop-C over CONUS.
    - Update to the tuning files for DMSP F17 and F18 to mitigate precipitation false alarms over coastal regions. The main changes to the tuning files were: (1) double the combined instrument and forward model uncertainty over all surface types, except ocean, and (2) increase the background emissivity uncertainty covariance by a factor of 10.
    - Integration of an additional option for the radiometric bias correction for S-NPP and NOAA-20.
  - 8/04/2021: OMPS-NP v4r1 J01/NPP/J02 Patch DAP delivered to NDE (Patch DAP to address issue with scripts. Also includes update to valid range for variables in output files)

- IDPS Builds Checkouts:
  - 7/07/2021: JSTAR submitted Block 2.3 Mx4 SOL deploy regression review/checkout data request to DPMS
  - 7/08/2021: JSTAR submitted summary report for Block 2.3 Mx3 I&T Deploy Regression Review/Checkout to DPMS/RTN/OSPO
  - 8/03/2021: JSTAR submitted Mx4 SOL review/checkout report to DPMS/RTN/OSPO

Accomplishments – JPSS Cal Val Supports

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

S-NPP	Weekly OMPS TC/NP Dark Table Updates	07/06/21, 07/13/21, 07/20/21, 07/27/21
NOAA-20	Weekly OMPS TC/NP Dark Table Updates	07/06/21, 07/13/21, 07/20/21, 07/27/21
S-NPP	Bi-Weekly OMPS NP Wavelength & Solar Flux Update	07/06/21, 07/20/21
NOAA-20	Bi-Weekly OMPS NP Wavelength & Solar Flux Update	07/13/21, 07/27/21
S-NPP	Monthly VIIRS LUT Update of DNB Offsets and Gains	07/20/21
NOAA-20	Monthly VIIRS LUT Update of DNB Offsets and Gains	07/20/21

- 7/21/2021: S-NPP CrIS Side-1 Beta/Provisional Maturity Review. The review team recommended that the SNPP CrIS Side-1 LWIR and SWIR SDR products are nominal and ready for operation and distribution.

- 7/16/2021: NDE 2.0.26 OPS
  - HEAP v3.1, and Blended Hydro products Operational

- 7/29/2021: IDPS Block 2.3 Mx3 TTO
  - NOAA-20 OMPS Nadir Profile In-Band Stray Light Correction (ADR9309/474-CCR-21-5364) Operational

- 8/3-12/2021: JSTAR SDR teams worked on the S-NPP data Recovery

- JSTAR Code/LUT/Product Deliveries:

  DAP to DPMS:

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

FY21 STAR JPSS Milestones

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Algorithm Updates DAPs				
CrIS: Initial J2 PCT DAP	Oct-20	Oct-20	10/16/20 02/08/21 (re-delivery, B2.3 Mx0)	
ATMS: Final J2 PCT/MM-coef DAP	Sep-21	Mar-22	All SDR J2 MM-coef updates pending on J2 instrument alignment measurement summary report from flight team, which may available to STAR by mid- to-late-September, 2021	
CrIS: Final J2 PCT/MM-coef DAP	Jul-21	Mar-22		
VIIRS: Final J2 Launch-ready LUTs/MM-coef DAP	Sep-21	Mar-22		
OMPS: Initial J2 Launch-ready LUTs DAP (combined code & LUT DAPs, ADR9095 & ADR9501)	Jan-21	Mar-21	03/10/21	12/28/20 DAP to ASSISTT
Imagery: N20 NCC LUT update DAP	Jul-21	Mar-22	NCC Banding Anomaly, ASF tool update	
Initial J2 ready DAP (include NPP/N20 updates), Clouds/Aerosol/VolcanicAsh/Cryosphere/LST/LSA/VPW	Jan-21	Mar-21	04/01/21 (to NDE) 05/26/21 (to CSPP)	downstream data testing
Initial J2 ready Active Fires DAP (include NPP/N20 updates, I-Band)	Jun-21	Jun-21	06/24/20	J2 I-Band AF
Surface Reflectance: Initial J2 ready DAP	Jan-21	Apr-21	04/19/21 (to NDE) 04/22/21 (to CSPP)	downstream data testing
NVPS (VI & GVF): Initial J2 ready DAP	Feb-21	Apr-21	04/19/21	Data testing
Vegetation Health: Initial J2 ready/final N20 DAP	Apr-21	Sep-21		Cloud deliveries
SST: Initial J2 ready DAP (ACSPO 2.80)	Apr-21	Aug-21		Cloud deliveries
NUCAPS: Initial J2 ready DAP	Apr-21	Apr-21	02/26/21 04/13/21 patch delivery 04/27/21 (to CSPP)	
MiRS & SFR: Initial J2 ready DAP	Mar-21	May-21	05/18/21 (v11.6, to NDE) 06/11/21 (v11.6, to CSPP)	documentation update
OMPS Ozone V8Pro: Initial J2 ready DAP	Dec-20	Dec-20	12/31/20 04/15/21 patch delivery **08/04/21 patch delivery**	
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, 06/02/21, 06/08/21, 06/15/21, 06/22/21, 06/29/21, **07/06/21, 07/13/21, 07/20/21, 07/27/21**
S-NPP: Bi-Weekly OMPS NP Wavelength & Solar Flux	Bi-Weekly	Bi-Weekly	10/06/20, 10/20/20, 11/03/20, 11/17/20, 12/01/20, 12/15/20, 01/12/21, 01/26/21, 02/09/21, 02/23/21, 03/16/21, 03/30/21, 04/13/21, 04/27/21, 05/12/21, 05/25/21, 06/08/21, 06/22/21, **07/06/21, 07/20/21**
S-NPP: Monthly VIIRS LUT update of DNB Offsets and Gains	Monthly	Monthly	10/21/20, 11/24/20, 12/22/20, 01/19/21, 02/17/21, 03/23/21, 04/20/21, 05/18/21, 06/16/21, **07/20/21**
NOAA-20: Weekly OMPS TC/NP Dark Table Updates	Weekly	Weekly	10/06/20, 10/13/20, 10/20/20, 10/27/20, 11/03/20, 11/10/20, 11/17/20, 11/24/20, 12/01/20, 12/08/20, 12/15/20, 12/22/20, 01/05/21, 01/12/21, 01/19/21, 01/26/21, 02/02/21, 02/09/21, 02/16/21, 02/23/21, 03/02/21, 03/09/21, 03/16/21, 03/23/21, 03/30/21, 04/06/21, 04/13/21, 04/20/21, 04/27/21, 05/04/21, 05/11/21, 05/18/21, 05/25/21, 06/02/21, 06/08/21, 06/15/21, 06/22/21, 06/29/21, **07/06/21, 07/13/21, 07/20/21, 07/27/21**
NOAA-20: Bi-Weekly OMPS NP Wavelength & Solar Flux	Bi-Weekly	Bi-Weekly	10/13/20, 10/27/20, 11/10/20, 11/24/20, 12/08/20, 12/22/20, 01/05/21, 01/19/21, 02/02/21, 02/16/21, 03/02/21, 03/23/21, 04/06/21, 04/20/21, 05/04/21, 05/18/21, 06/02/21, 06/15/21, 06/29/21, **07/13/21, 07/27/21**
NOAA-20: Monthly VIIRS LUT update of DNB Offsets and Gains	Monthly	Monthly	10/21/20, 11/24/20, 12/22/20, 01/19/21, 02/17/21, 03/23/21, 04/20/21, 05/18/21, 06/16/21, **07/20/21**
Block 2.3 Mx builds I&T deploy regression data review/checkout (**Nov-20 Mx0**; **Mar-21 Mx1**; **May-21 Mx2**; **Jul-21 Mx3**; Aug-21 Mx4; Sep-21 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 06/16/21: Mx3 SOL review/checkout report **07/08/2021: Mx3 I&T review/checkout report** **08/03/2021: Mx4 SOL review/checkout report**
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

Color code:

Green:　　　　**Completed Milestones**
Gray:　　　　**Non-FY21 Milestones**

ATMS SDR

Accomplishments / Events:

- Updated ATMS TVAC data processing programs to support JPSS-3 ATMS TVAC data analysis.
- Started JPSS-3 ATMS thermal vacuum test data analysis. Processed thermal cycle data to ensure all test targets and environment are ready for calibration test.
- Updated ATMS TDR/SDR processing program to include overall data quality monitoring and warning message when overall quality is not 100%
- Kept discussing the ATMS antenna pattern changes in the TVAC Calibration Test Equipment (CTE) targets and the internal calibration targets
- Kept updating JPSS ATMS SDR team calibration/validation document library and the library maintenance manual
- Kept developing spacecraft telemetry data reader program to support upcoming spacecraft level TVAC test
- Kept updating 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.
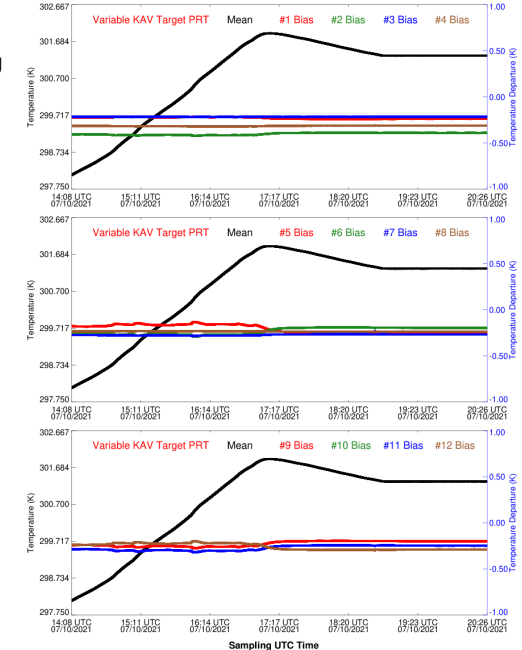
Issues/Risks:

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	
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**; **Jul-21 Mx3**; Aug-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 07/06/21 Mx3 I&T	Report

Highlights:

ATMS science data overall data quality flag global map

NOAA-20 ATMS Overall Data Quality Flag Global Distribution
29 Jul 2021
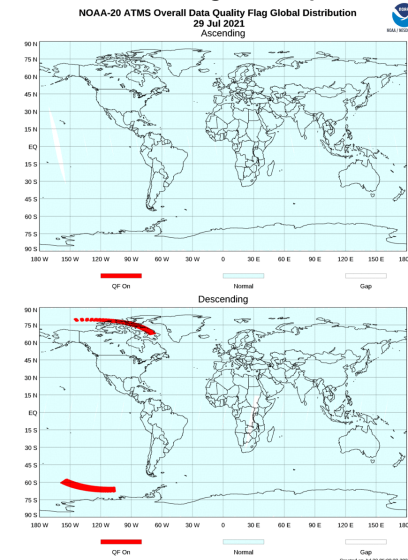
JPSS-3 Instrumental TVAC Thermal Cycle Variable KAV Target PRT
RC: RC1, Period: 14:08 07/10/2021 ~ 20:26 07/10/2021

Accomplishments / Events:

- On 12 July 2021, S-NPP CrIS was commanded to operate using the primary electronics on Side-1. Commanding concluded on 13 July 2021. The longwave infrared (LWIR) and short-wave infrared (SWIR) bands were found to be nominal on Side-1. The mid-wave infrared (MWIR) band remains inoperable following the anomaly in March of 2019.
- Following an intensive calibration and validation period, the S-NPP CrIS Side-1 SDR product was declared to hold provisional maturity after a joint beta and provisional maturity review was held on 21 July 2021. The noise performance is consistent with previous Side-1 and Side-2 performance. Both relative and absolute spectral offsets for both functioning bands are within ±2ppm (**Fig. 1**). The radiometric FOV-to-FOV consistency observed for LW and SW bands is within 0.1 K (**Fig 2**). The geolocation accuracy is slightly degraded compared to Side-2, but consistent with previous Side-1 accuracy and within the specification (**Fig. 3**). S-NPP CrIS SDR data is now available for users in groups 1 and 2.
- JPSS-3 CrIS noise performance was assessed using TVAC data from the mission nominal plateau. The instrument noise at full spectral resolution (FSR) with self-apodization meets the specification for all FOVs over all three bands. The full noise covariance matrix was also computed using the principal component method (**Fig. 4**). Only the SWIR shows higher correlation values which are not cause for concern as the near diagonal values are due to the known ILS effect. Other that the ILS effect, no systematic out-of-band correlation between frequencies was detected.
- CrIS S-NPP had a scene selection module count error (position) on 6 July 2021. This resulted in a data loss of about one orbit.
- NOAA-20 CrIS is now showing early sign of a noise increase event for MWIR FOV 5 beginning around 20 July 2021. The noise associated with this FOV will continue to be monitored.

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	
S-NPP CrIS Side-1 SDR Product at Provisional Maturity Level			07/21/21	
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**; **Jul-21 Mx3**; Aug-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 **07/07/21 Mx3 I&T**	Report

Highlights:
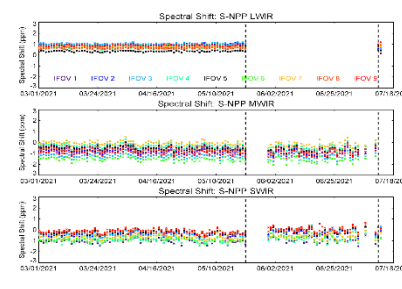
(1) The spectral shift of S-NPP SDR calculated using the modeled radiance as reference.
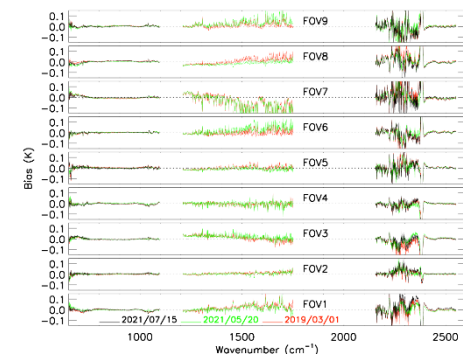
(2) FOV-2-FOV radiometric variability of SNPP CrIS for 2021-07-15 on side-1, 2021/05/20 on side-2, and 2019-03-01 on
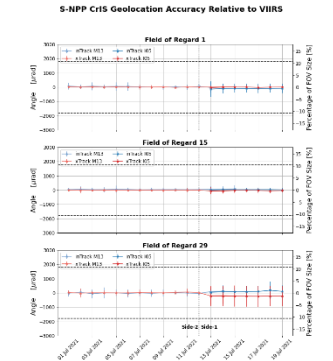
(3) Geolocation accuracy before and after S-NPP CrIS side switch for FORs 1, 15, and 30.
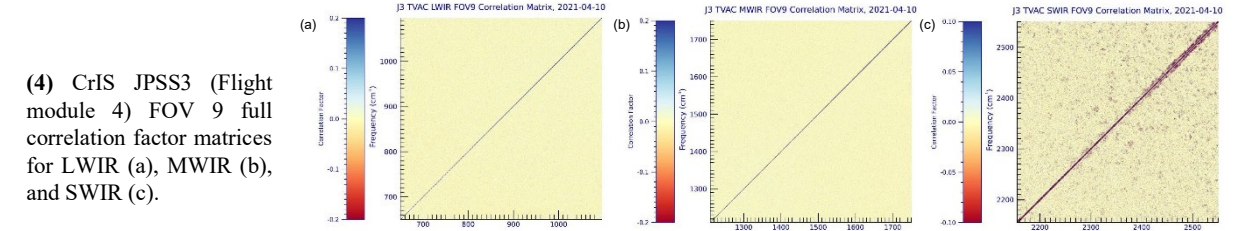
(4) CrIS JPSS3 (Flight module 4) FOV 9 full correlation factor matrices for LWIR (a), MWIR (b), and SWIR (c).

Accomplishments / Events:

- Created and delivered for deployment in the IDPS operations updated NOAA-20 and Suomi NPP DNB offset and gain ratios LUTs generated using new moon calibration data from July 10, 2021
- Developed/evaluated DCC-based Suomi NPP VIIRS RSB striping correction factors for M1-M4. Results were presented during VIIRS SDR/EDR and JPSS Leads Meetings.
- Preparation for recalibration and reprocessing of NOAA-20 VIIRS after comprehensive analysis of long term lunar, DCC, SNOx, and SRRS-corrected solar F factor data.
- Developed VIIRS Global Area Coverage (VGAC) processing software tool; Participated VGAC community meeting with users from aerosol, cloud, and polar research community
- Delivered checkout report for Block 2.3 Mx 4 SOL Deploy Regression
- Delivered updated S-NPP VIIRS-RSBAUTOCAL-DNB-MOON-ILLUMINATION LUT test package

Overall Status:

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

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

Issues/Risks:

None

Milestones

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/23/20	
Updated Cal/Val plan (address DPMS comments)			04/28/21	
Initial J2 LUTs: re-delivery			02/10/21	
JCT2 - Data System Event	Aug-21	Aug-21		
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	
N20 VIIRS Post-VIGMU Geolocation LUTs Update (ADR9599)			06/28/21	
S-NPP VIIRS-RSBAUTOCAL-DNB-MOON-ILLUMINATION-LUT Update (ADR9578)			07/23/21	
VIIRS LUT update of DNB Offsets and Gains	Monthly	Monthly	On schedule	NPP & N20
Parallel OPS support	Dec-20	Dec-20	Dec-20 Jan-21	11/6-12/4/20 1/11-21/21
Verification of cloud implementation	Dec-20	Dec-20	Dec-20	Report
IDPS Mx build I&T deploy support:				
Block 2.3 Mx builds I&T deploy regression data review/checkout (Nov-20 Mx0; Mar-21 Mx1; May-21 Mx2; Jul-21 Mx3; Aug-21 Mx4; Sep-21 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 07/02/21 Mx3 I&T 07/15/21 Mx4 SOL	Report

Highlights:
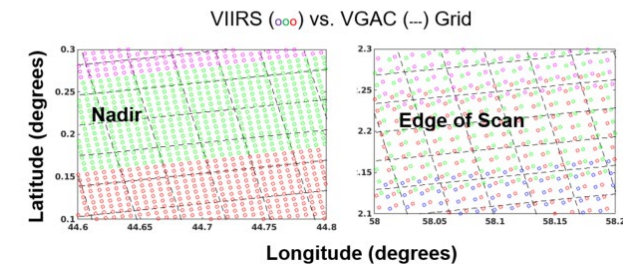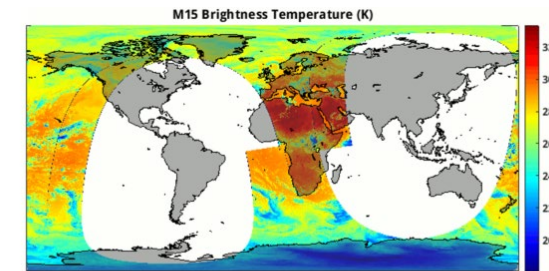
NOAA/STAR has developed the capability to produce VIIRS Global Area Coverage (VGAC) data from recalibrated/reprocessed SNPP VIIRS SDR data and provide to NOAA/NCEI for stewardship and distribution (NCEI POC: Ken Knapp). Tool and software for prototype VGAC generation are developed at NOAA/STAR. This product will facilitate long term EDR development, user engagement and continuation of AVHRR GAC to support climate study.

Accomplishments / Events:

- Delivered OMPS weekly Dark tables and NP solar irradiance bi-weekly LUTs.
- Assessed NOAA-20 and SNPP OMPS radiance degradation performance. A non-negligible degradation rate is observed, which varies from satellite sensor and channel with the largest degradation at the shortest wavelength up to 3.5 % for SNPP NP.
- Completed the reprocessing of SNPP OMPS SDR data.
- Investigated the dark rate issue that happened in the OMPS NP SDR data processing.
- Verified the NOAA OMPS dark processing code against the NASA dark count data files.
- Generated the stray light LUT for J2 OMPS NM backup spatial resolution using PSF.
- Conducted a coordination meeting with the STAR CRTM team to resolve the issues in using the vectorized CRTM package.
- Standardized the existing SNR estimation code for operational OMPS SDR data.
- Support the testing and verification of the SNPP/NOAA-20 OMPS NM updated geolocation field angle map (FAM) LUT into the operational OMPS ADL processing.
- Continued PCA-based SNR analysis of SDR data and analyzed the SNR of NOAA-20 higher resolution of NM SDR data.

Overall Status:

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

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

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
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; Jul-21 Mx3; Aug-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 06/15/21 Mx3 SOL 07/07/21 Mx3 I&T 08/02/21 Mx4 SOL	Report

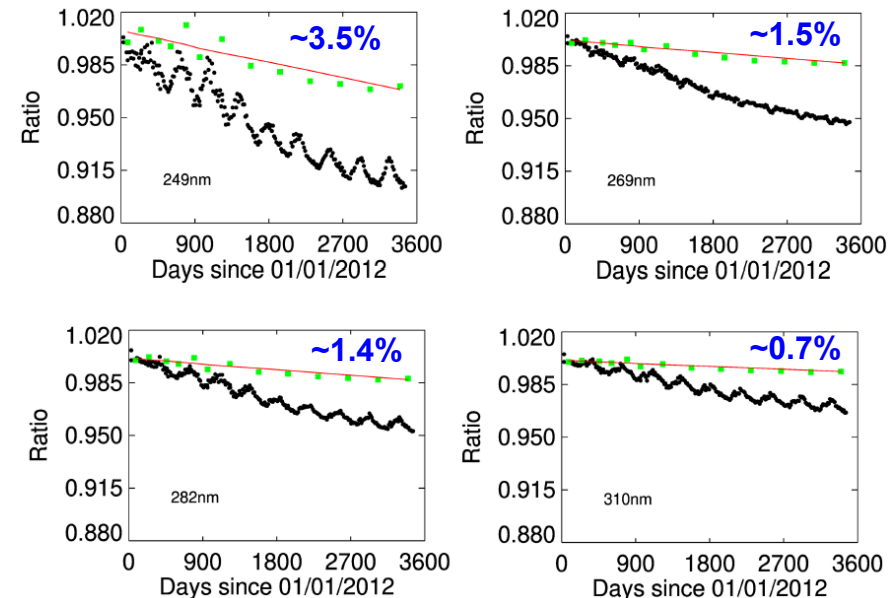### SNPP OMPS NP instrument optical degradation

Figure 1: *The most recent Suomi OMPS-NP instrument optical degradation in red. Examples shown are for channel 249nm, 269nm, 282 nm, and 310 nm. Data from Working Solar Reflective Diffuser in black, and from the Reference Solar Reflective Diffuser in green, and radiance degradation rate in red.*

SDR Reprocessing

Accomplishments / Events:

– Discussion is ongoing to finalize the implementation details in CLASS for the transition of the reprocessed SNPP SDR data

– Delivered the test data of ATMS_V1, ATMS_V2, OMPS_V1, OMPS_V2, CrIS_V2 and VIIRS to CLASS/NCEI

– Finalized the NPP SDR/TDR CLASS Family Description with the assistance of ATMS, CrIS, VIIRS and OMPS SDR teams

– The V2 SNPP OMPS SDR reprocessing is almost completed

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

– A paper entitled "Assessment of the reprocessed Suomi NPP VIIRS enterprise cloud mask product" has been published in Remote Sensing Letters (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.
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Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Reprocessing of N20 CrIS for 2018-04-01 to 2019-06-23	Nov-20	Nov-20	Nov-20	
Extend SNPP VIIRS reprocessing to 2020	Dec-20	Jan-21	Jan-21	The short delay was caused by one hard drive on UMD server Bamboo was down in Dec. 2020
ECM reprocessing for 2018-04-01 to 2020-03-11	Dec-20	Jan-21	Jan-21	Same as above
Present validation results on the reprocessed S-NPP SDR data at the AMS Meeting	Jan-21	Jan-21	Jan-21	
Transition of SNPP RDR and reprocessed SDR data to CLOUD	Jun-21	Jun-21	May-21	
Complete planning and testing on transition of S-NPP reprocessed SDR data to CLASS	Sep-21	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:

• Comparison of the reprocessed Enterprise Cloud Mask (ECM) product with the operational one shows that the overall differences are small. Most of the discrepancies occur between neighboring types at the cloud edge (Figure).

• These findings help lay the foundation for the user community to understand the reprocessed ECM product.

• In addition, due to the better quality of the reprocessed VIIRS SDR data that are utilized to generate the reprocessed ECM product, it is expected that the reprocessed ECM product will have better stability and consistency compared to the operational ECM products. Therefore, the reprocessed ECM product is a useful benchmark for the user community.
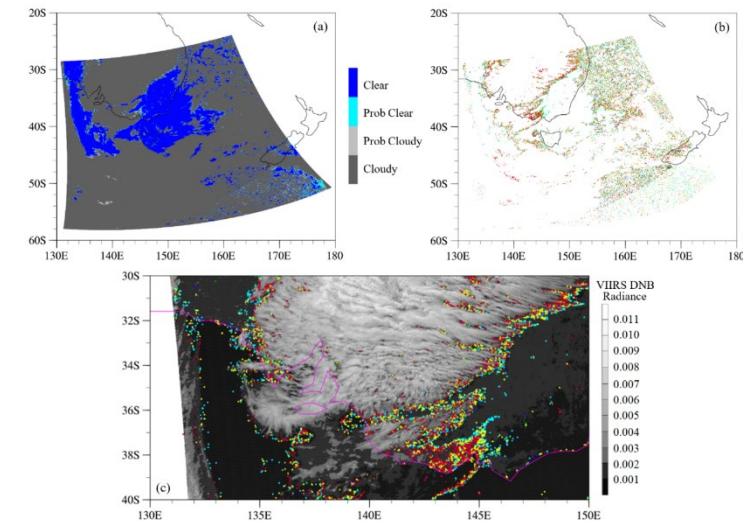

Figure: Cloud mask types of (a) the reprocessed ECM products for six granules on May 1, 2018. (b): pixels that have different cloud mask types between the operational and reprocessed ECM product. (c): A zoomed-in plot of the pixels that have different cloud mask types overlaid on the VIIRS DNB radiance (unit: $W/cm^2 \cdot sr^{-1}$) within the domain of ($30^oS \sim 20^oS$, $130^oE \sim 140^oE$). The pixel is color-coded based on the cloud mask type of the operational and reprocessed ECM products for each pixel.

ICVS

Accomplishments / Events:

- Provided near real time sensor data quality monitoring event reports, including NOAA-20 and S-NPP CrIS scene select module (SSM) position count error and ATMS operational status indicator quality flag, from ICVS-LTM modules
- Updated ATMS data quality flag automatically notification module to add overall data quality indicator in meta data check to support the development of anomaly impact watch portal
- Monitored near real time near US coast hurricane evolution by generating 3D warm core animation using both VIIRS and ATMS radiance data, such as Hurricane ELSA
- Completed the beta version of the ICVS-AWP (also adding NPP CrIS Longwave Anomaly event description and associated sensor health status and data quality change records)
- Developed Python code based reprocessing SDR data quality checking toolkit to support VIIRS and OMPS SDR team reprocessing data evaluation
- Kept developing AI based instrument anomaly detection package by implementing a Long short-term memory (LSTM) neural network
- Gave a presentation to clarify the roles and responsibilities of ICVS in STAR-JPSS program so as to better collaborate with other radiance team members
- The 32-day inter-sensor bias comparison journal article based on ICVS-LTM team work is accepted.

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

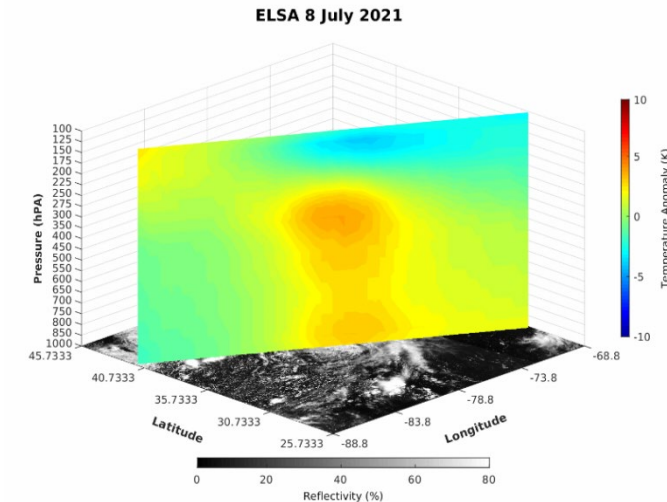| Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Develop JPSS-2 ICVS prototype RDR portion (beta) (SNPP or N20 as proxy)	Jan-21	Jan-21	Jan-21	
Develop JPSS-2 ICVS prototype SDR portion (beta)	Apr-21	Apr-21	Apr-21	
Develop ICVS-Vector code prototype (beta)	Jun-21	Jun-21	Jun-21	
Develop ICVS anomaly impact watch (AWP) portal prototype (beta)	Jul-21	Jul-21	Jul-21	
Develop ICVS testbed code (beta)	Aug-21	Aug-21		
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 CrIS Data Gap due to SSM postion count error on June 19, 2021
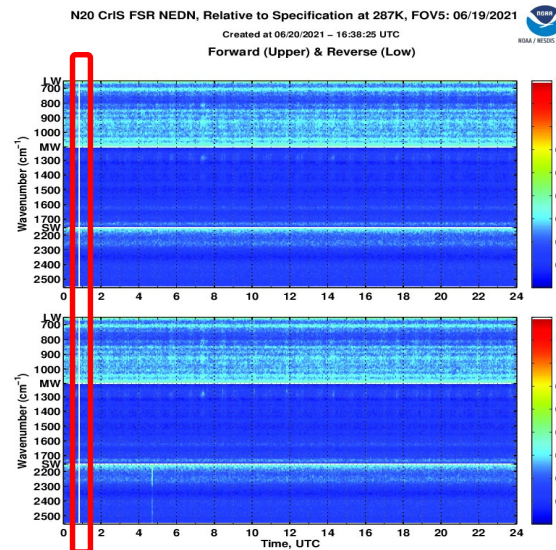
Hurricane warm core 3D structure of Hurricane ELSA based on NPP VIIRS and ATMS radiance data on 07/08/2021

Development of ICVS Vector Dynamic Plots Anomaly (Beta Version)

Visit https://www.star.nesdis.noaa.gov/icvs-beta/index_icvs_vector_sc.php for more (Courtesy of L. Brown for the website development support)

VIIRS Imagery

Accomplishments / Events:

- **Two code change packages** will be in the Mx4 build, effective 9 Sep 2021:
  - **NCC banding anomaly fix**: This was verified with NCC test data from **Build 2.3 Mx 4.**
  - **All 16 M-band EDR Imagery:** This was verified by creating true-color EDR Imagery with test data from Build 2.3 Mx 4. See the lower-right panel for an example!
- **NCC/EDR Imagery is now available in real time on SILDER** (https://col.st/Tdri8)
- The Imagery Team is glad to learn (from Jim McNitt) that **SNPP EDR Imagery will continue to be available on IDPS/GRAVITE**, even though other EDR products from SNPP will be discontinued sometime after the launch of J2, because "ESPDS/PDA has a 2-satellite requirement only and is only sized for a capacity for 2 only,"
- Reminder: **Bill Line** – will be the new StAR Imagery Team Lead when Hillger retires in Dec 2021. Be sure to include him in Team Lead correspondence and meeting notices.

Overall Status:

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

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

Issues/Risks:

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

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**; **Jul-21 Mx3**; Aug-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 06/09/21 Mx3 SOL **07/06/21 Mx3 I&T 07/20/21 Mx4 SOL**	

Highlights: Image of the Month

Figure: First VIIRS EDR true-color image, now that all VIIRS M-bands will be available as EDR Imagery, due code changes transferring to operations starting 9 Sep 2021. (Image courtesy of C. Seaman)

Clouds
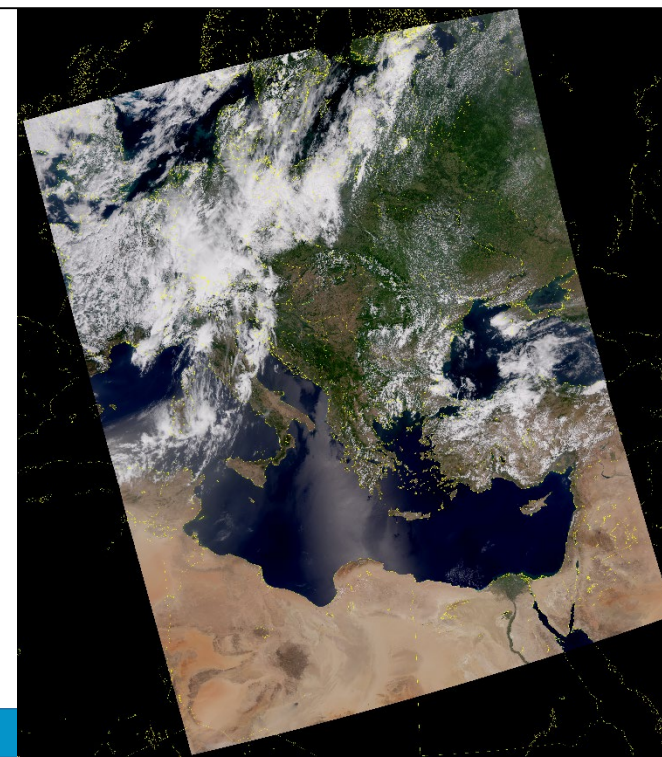
Accomplishments / Events:

- The ECM team investigated and is tracking an issue with the lunar illumination fraction within the VIIRS ECM LUT. Work is ongoing to assess the impact and any needed mitigation.

- ASSISTT and the ACHA team are investigating an issue with the delivered version of ACHA with the ifort compiler. Depending on the analysis, this may impact the version of code delivered within the DAP.

- The CIRA team updated the new aviation website and fixed bugs in 3-D gridded cloud data processing codes. The website (https://io.cira.colostate.edu/aviation) was released to key users for pre-evaluation as part of the JPSS Aviation Initiative/AK Cloud Demo.

- VIIRS GAC (VGAC) is the sub-sampled VIIRS data (Figure 1), which allows to process a big amount of data in the short period of time. It is helpful for cloud algorithm verification and climate studies.

Overall Status:

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

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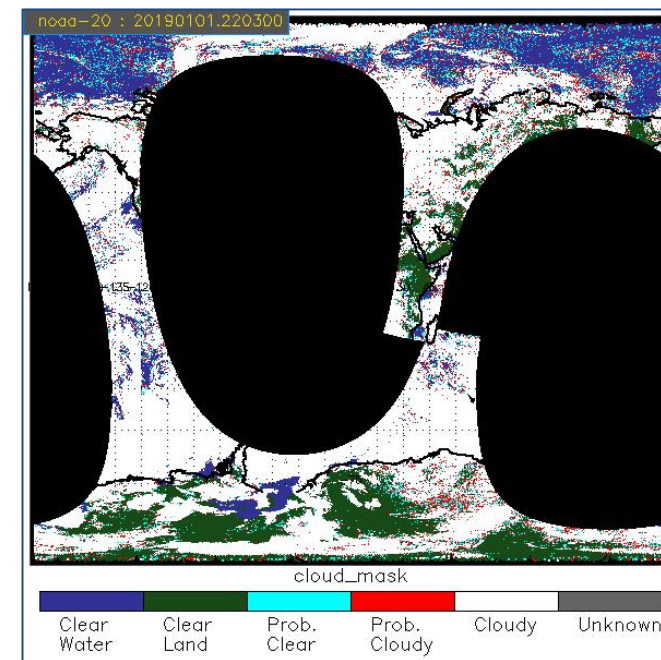
Issues/Risks:

None

Milestones:

- **See next slides**

Highlights:

Figure 1. VIIRS GAC (VGAC) is a sub-sampled VIIR data. The Cloud Team has trained Enterprise Cloud Mask (ECM) version 2 with the VGAC data set.

NOAA-20, VIIRS GAC 2019-01-01 21:12 UTC

Clouds (Cloud Mask)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
JPSS-2 Schedule				
J2 Cal/Val Plan - draft delivery	Jun-20	Jun-20	06/10/20	
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/21/20	
Updated Cal/Val plan (address DPMS review comments)			04/23/21	
Initial J1 ready DAP to ASSISTT	Apr-20	Apr-20	Apr-20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Jan-21	Mar-21	04/01/21	downstream data testing
Initial J2 ready DAP to CSPP			05/26/21	
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21		
Algorithm Updates Review	Sep-20	Sep-20	07/21/20	
Algorithm Updates/Cal-Val Activities				
Add in DNB into ECM2 LUTs	Mar-21	Mar-21	Feb-21	
Work with NCEP on ASR assimilation. Adjust mask as necessary	Mar-21	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	May-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
Initial J2 ready DAP to CSPP			05/26/21	
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21		
Algorithm Updates Review	Sep-20	Sep-20	07/21/20	
Algorithm Updates/Cal-Val Activities				
Optimize cloud phase thresholds for NOAA-21 and maintain code consistency with GOES-R deliveries	Mar-21	Mar-21	Feb-21	To ASSISTT
Modify phase as needed based on height/winds interaction and development from GOES-R	Aug-21	Aug-21		
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
Initial J2 ready DAP to CSPP			05/26/21	
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21		
Algorithm Updates Review	Sep-20	Sep-20	07/21/20	
Algorithm Updates/Cal-Val Activities				
Support NCEPs use for ASR assimilation	Mar-21	Mar-21	Mar-21	To ASSISTT
Continue improving multilayer ACHA by analysis of CALIPSO and AEOLUS lidars and extend to level of best fit of Polar Winds	Mar-21	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
Initial J2 ready DAP to CSPP			05/26/21	
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21		
Algorithm Updates Review	Sep-20	Sep-20	07/21/20	
Algorithm Updates/Cal-Val Activities				
Develop a method that includes IR measurements to improve the performance of potentially thin clouds using ACHA technique	Aug-21	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
Initial J2 ready DAP to CSPP			05/26/21	
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21		
Algorithm Updates Review	Sep-20	Sep-20	07/21/20	
Algorithm Updates/Cal-Val Activities				
Extend NCOMP with JPSS-2 LUT	Jul-21	Jul-21	Jun-21	
Adding improved unit test tools to science code	Sep-21	Sep-21		
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
Initial J2 ready DAP to CSPP			05/26/21	
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21		
Algorithm Updates Review	Sep-20	Sep-20	07/21/20	
Algorithm Updates/Cal-Val Activities				
Leverage GOES-RR to target characterization of overlapping cloud assess CBH performance for multi-layer cloud systems	Jun-21	Oct-21		Model dev and performance ready for VIIRS assessment Implementation to take several months
leverage DCOMP nighttime COD (DNB) to improve performance over IR-only	Sep-21	Sep-21	Feb-21	To ASSISTT
Validate products from SAPF and begin ARM data analysis to fill CALIOP/CloudSat void	Sep-21	Sep-21		
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
Initial J2 ready DAP to CSPP			05/26/21	
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21		
Algorithm Updates Review	Sep-20	Sep-20	07/21/20	
Algorithm Updates/Cal-Val Activities				
Include super-cooled and convective probability	Mar-21	Mar-21	Feb-21	To ASSISTT
Continue the visualization and demonstration of CCL for the Aviation Weather Center, with focus on Alaska Region and Hawaii	Sep-21	Sep-21		
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

July, 2021

Accomplishments / Events:

- Evaluated J2 test data for AOD retrieval. The test data does not contain Earth scenes, so no AOD retrieval was performed. However, confirmed format and future content of all science data needed can be ingested.
- Checked correct implementation of updated surface reflectance relationships in the enterprise AOD algorithm.
- Finished reprocessing the SNPP VIIRS EPS AOD retrievals(2012-2019) in the AWS, and fully validated the 6-year (2012-2018) reprocessed AOD with AERONET Version 3 Level 2.0 data.

Overall Status:

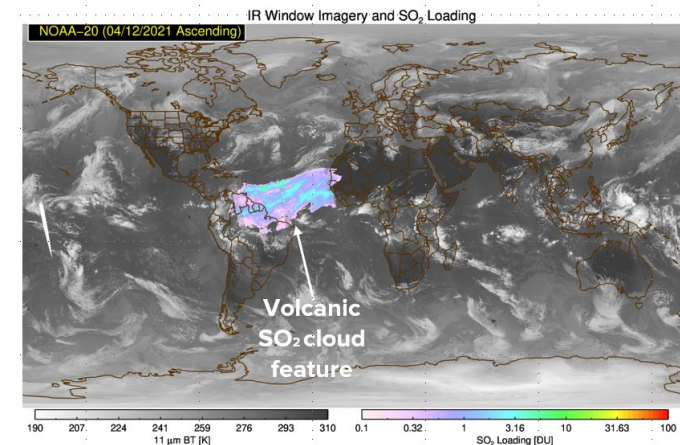|	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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

Issues/Risks:

No risks

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

Highlights: Aerosol trends over China highlight air quality benefit from the phase-out of older vehicles beginning in 2013.
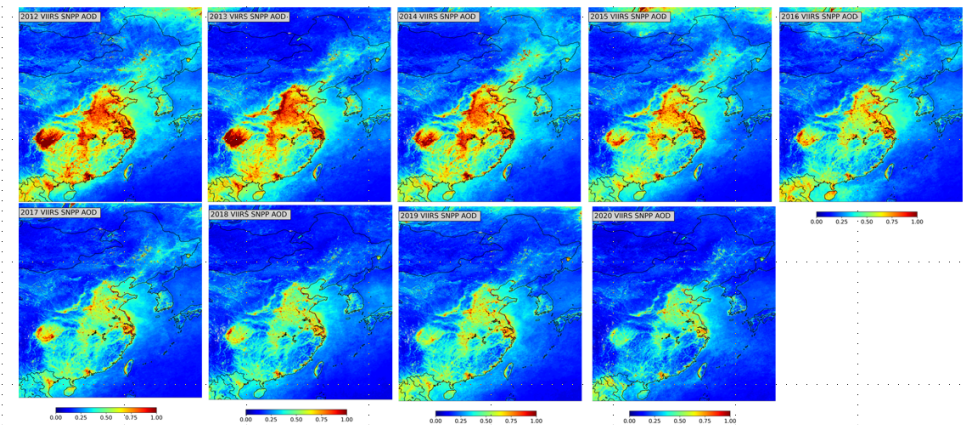
- Reprocessed SNPP annual mean VIIRS AOD data over China shows clear (known) decreasing trend in pollution. Before we analyze 2020 impact of COVID-19 lockdown impact on aerosols we have to de-trend and de-seasonalize the data
- This reduction in particulate pollution as detected by VIIRS AOD is due to strict pollution control strategies (*chief among them phasing out old vehicles*) implemented in China after the 2013 "PM2.5 Crisis" (UNEP report, 2019)

Aerosol (AOD & ADP) Milestones

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

Volcanic Ash

Accomplishments / Events:

- Demonstrated DevOps process, putting together lessons learned presentation for August
- Maintained and verified quality of S-NPP and NOAA-20 Volcanic Ash products (JPSS EDR and Volcat)

Overall Status:

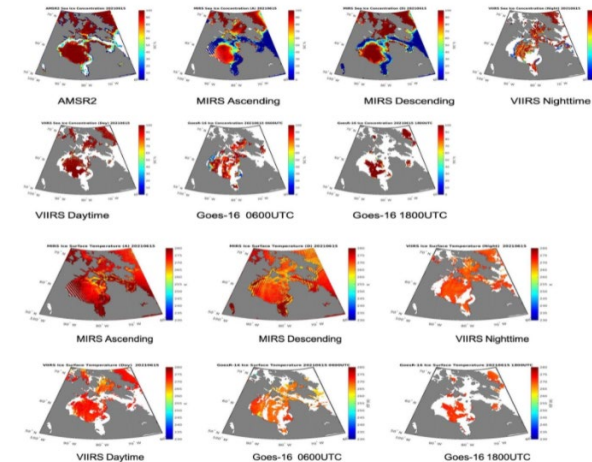|	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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

Issues/Risks:

None

Highlights: *Volcanic Ash Data Distribution Model for rapid dissemination*

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/15/20	
Updated Cal/Val plan (address DPMS review comments)			04/29/21	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Jan-21	Mar-21	04/01/21	downstream testing
Initial J2 ready DAP to CSPP			05/26/21	
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21		
Software and LUT updates in preparation for J2	Sep-21	Sep-21		
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		

Global NOAA-20 (VIIRS/CrIS) composite of SO₂ loading for volcanic features

Volcanic clouds are automatically associated with specific volcanic events/sequences, where possible, and are subsequently tracked

VOLCAT event files: single feature cutouts; small data volume; ideal for rapid dissemination

VOLCAT composite maps: single or multi-sensor sensor space/time composites with feature attribution data; ideal when only periodic snapshots are needed (e.g. well dispersed clouds, data insertion based modeling)

Cryosphere

Accomplishments / Events:

- A manuscript titled "A Blended Sea Ice Concentration Product from AMSR2 and VIIRS" has been published in the journal Remote Sensing as part of a special issue on Polar Sea Ice: Detection, Monitoring and Modeling (https://doi.org/10.3390/rs13152982). Authors are Rich Dworak (Cooperative Institute for Meteorological Satellite Studies), Yinghui Liu and Jeff Key (STAR), and Walt Meier (University of Colorado).

- Progress made on automating satellite-derived sea ice product comparisons (see highlight).

- A New method to estimate change in sea ice thickness was developed by a PhD student at CIMSS, James Anheuser uses GCOM/AMSR2 data. It first estimates the snow-ice interface temperature from AMSR2 brightness temperatures, then applies a model based on Stefan's Law to estimate the change in ice thickness from one time step to the next. Given an initial ice thickness, the method then estimates ice thickness from Fall to Spring. Initial comparisons with an ice mass buoy and other related measurements are promising.

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:

Ice concentration (top two rows) and ice surface temperature (bottom two rows) from AMSR2 (concentration only), MIRS (ascending and descending orbits), VIIRS (nighttime and daytime), and GOES-16 (0600 and 1800 UTC) on 15 June 2021 over Hudson Bay. These comparisons are being automated to allow for improved detection of potential product issues.

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation/Comments
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/30/20	
Updated Cal/Val plan (address DPMS review comments)			04/28/21	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Jan-21	Mar-21	04/01/21	downstream testing
Initial J2 ready DAP to CSPP			05/26/21	
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21		
Preparation for JPSS-2	Sep-21	Sep-21		
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		

Active Fires

Accomplishments / Events:

- NWS upgraded the Air Quality Model based on the Community Multiscale Air Quality Modeling System (CMAQ). NOAA/NESDIS, along with Air Resources Lab (ARL), modified the NESDIS Global Biomass Burning Emissions Product (GBBEPx) to provide near-real time fire smoke emission inputs into CMAQ. One of the critical inputs to GBBEPx for fire-related smoke emissions is the Suomi NPP and NOAA-20 VIIRS Active Fire product from NDE. This is a great success story of carrying research and development at STAR all the way to full operational use at National Weather Service, which took several years of dedicated effort by STAR scientists. (See highlight)

- Drs Shobha Kondragunta and Amy Huff were interviewed by the Boston Globe on their research on fires as well as STAR work on Land Surface Temperature (LST) by Bob Yu's group.

- Virtual meeting was held by CEOS to discuss the specifics of a Wildfire Pilot. Current NESDIS participants are Ivan Csiszar and Mike Pavolonis (STAR), and Wilfrid Schroder and Ellen Ramirez (OSPO).

Overall Status:

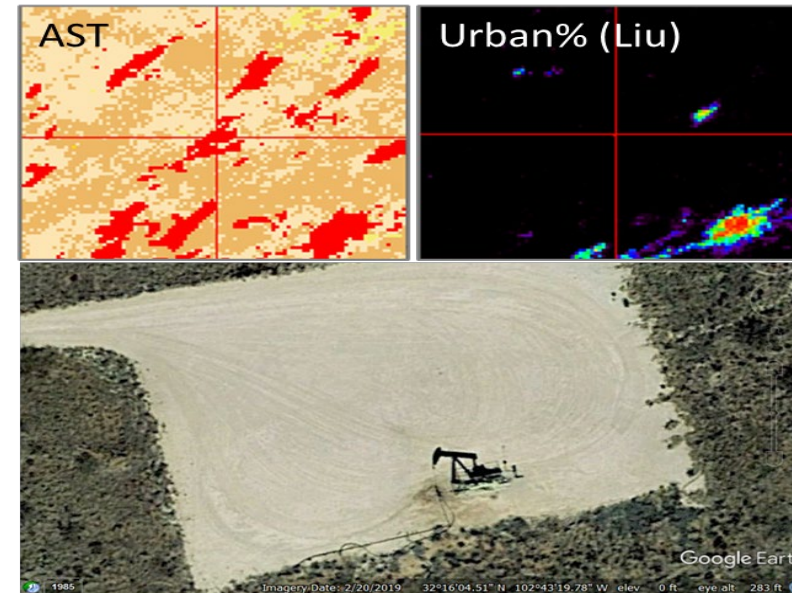|	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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

Issues/Risks:

None

Milestones

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/30/20	
Updated Cal/Val plan (address DPMS review comments)			04/27/21	
Initial J2 Active Fires DAP (I-Band) to NDE			06/24/20	
Final J2 updates DAP to ASSISTT	Aug-21	Aug-21	Jun-21	
Final J2 Active Fires DAP to NDE	Oct-21	Oct-21		
I-band algorithm improvements	Sep-21	Sep-21		
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:
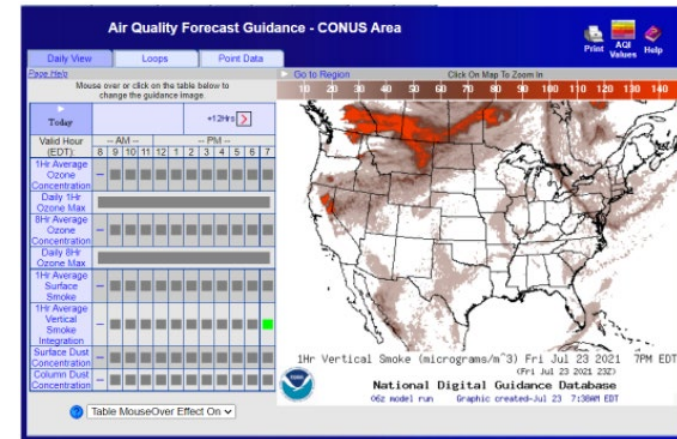
New improvements to NOAA NWS CMAQ were made in July 2021. Products such as the hourly vertically integrated smoke concentration forecast shown here use a model that now ingests the NESDIS GBBEPx product based on SNPP and NOAA-20 VIIRS fire detections.

Surface Type

Accomplishments / Events:

- STAR-UMD VIIRS Surface Type team has downloaded and processed S-NPP and NOAA-20 VIIRS granule surface reflectance data acquired in July 2021.
- The team has obtained several 10M-30M global land cover products that were released recently, including:
  - A 30M product produced by Liu et al. (2020)
  - A 10M product just released by ESRI
- The team has developed C++ tools needed to process these extremely large datasets (hundreds of GB each) to extract information that can be used to improve the VIIRS surface type product, especially for difficult classes such as urban and cropland.

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:

A Comparison of the urban class (red) mapped in the VIIRS Annual Surface Type (AST) product and percent urban area (black to red indicate low to high) calculated from a global 30M land cover product (Liu et al. 2020) against high resolution Google Earth imagery (bottom) over west Texas reveals that many areas cleared for oil wells were mapped as urban in the current AST product. The team will use newly available high resolution global land cover products to improve the mapping of urban and other surface types that are difficult to classify.

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		

Surface Reflectance

Accomplishments / Events:

- Refine the L3 experimental SR product and routinely generate at local machine and followed by the true color image for product monitoring.
- Comparing L3 experimental SR with VNP09GA true color image.
- Performed the NOAA VIIRS SR and NASA VIIRS SR (VNP09) intercomparison at globally distributed BELMANIP2 sites.
- Continue to develop the AEROENT SR validation tool, adding the VIIRS AOD EDR subset along with the TOA reflectance, GEO data, SR product and AEROENT measurements and retrieved parameters.
- Verify the uncertainty of 6S by comparing with MODTRAN, check the impact of using SNPP VIIRS SR LUT for NOAA20 and J2 VIIRS.

Overall Status:

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

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

Issues/Risks:

None

Milestones

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/30/20	
Updated Cal/Val plan (address DPMS review comments)			04/28/21	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Jan-21	Apr-21	04/19/21	downstream testing
Initial J2 ready DAP to CSPP			04/22/21	
Final J2 ready DAP to ASSISTT	May-21	May-21		
Final J2 ready DAP to NDE (include NPP/N20 updates)	Oct-21	Oct-21		
NOAA-20 algorithm adjustments (I3 bad detector)	May-21	May-21	04/19/21	
Algorithm testing and updates (ECM, QF)	Sep-21	Sep-21		
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:
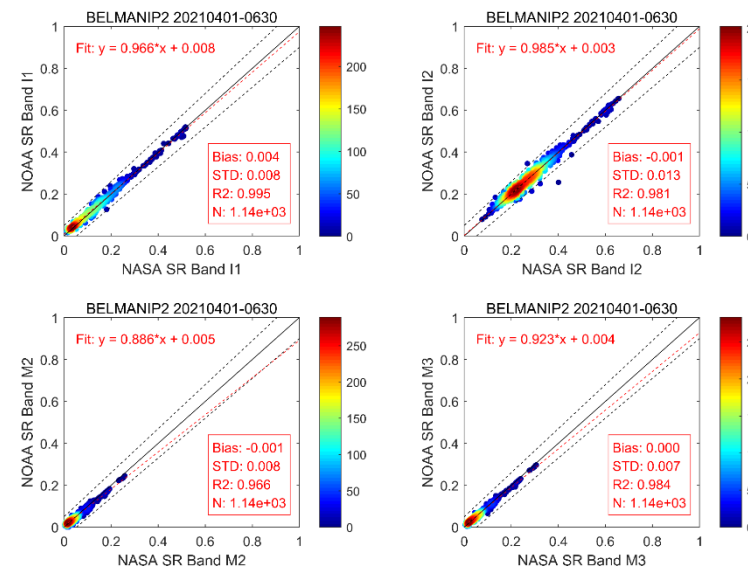
- NOAA and NASA SR product Inter-comparison at BELMANIP2 Site (202104-06)
- Using confidently clear, cloud mask quality at least medium, no cloud shadow nor cirrus, no snow present, and the AOD loading is low.
- Overall the two product have a good agreement most pixels are within the requirements

■ SR monitoring using local L3 SR experimental product

• The compositing algorithm as the following table shows, pixel with higher score will be select for that grid.

Score	Criteria	QF
0	Filled value	
1	Bad L1B Input	
2	High VZA (>=60)	QF1 Bit4
3	Low Sun (>=85)	QF1 Bit5
4	Confidently Cloudy	QF1 Bit2-3
5	Probably cloudy	QF1 Bit2-3
6	Probably clear	QF1 Bit2-3
7	Cloud Shadow	QF2 Bit3
8	Climatology AOD	QF7 bits 2-3
9	High AOD	QF2 Bit4
10	Snow	QF7 Bit0
11	None of above	

S-NPP VIIRS Daily SR 20210613

Local L3 SR experimental product compared with VNP09GA true color image.

■ NOAA and NASA VIIRS SR Intercomparison

■ Datasets:
• NASA VNP09GA (SNPP VIIRS L3 daily SR)
• NOAA SNPP VIIRS L2 SR
■ Matchup method (237 sites, 25731 matchups)
• 4 satellite/solar angles difference within 0.1 degree.
■ Date period.
• April 1st to June 30th 2021
■ Locations.
• BELMANIP2 sites (445)

BELMANIP2 Sites used for Inter-Comparison

Land Surface Temperature

Accomplishments / Events:

- Investigated the intense heatwave in Southwestern US and Canada using L3 VIIRS LST data. Highlighted the heatwave in Death Valley, CA. (highlight, slide2 &3)
- A multi-year LST climatology is generated to study impacts by extreme weather events. It is used to analyze the global monthly LST anomaly.
- Submitted the monthly LST anomaly report for June. (slide 4)
- Updated the LST plots using python (highlight).
- Investigated the simulation data uncertainty attributed to the interpolation applied in generation of the simulation database. (Slide 5). Troubleshooting MODTRAN issues with the libs. Modified the code for generation of MODTRAN simulation input.
- Finalized and submitted the manuscript to the publisher for 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
Initial J2 ready DAP to CSPP			05/26/21	
Final J2 ready DAP to ASSISTT	Mar-21	May-21	May-21	
Experimental error estimate dataset	May-21	May-21	May-21	
Validation and improvement of L3 LST product	Jul-21	Jul-21	May 21	Delivered together with J2 ready DAP
Annual algorithms/products performance report	Aug-21	Aug-21		
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:

Heatwave monitoring using L3 VIIRS LST data
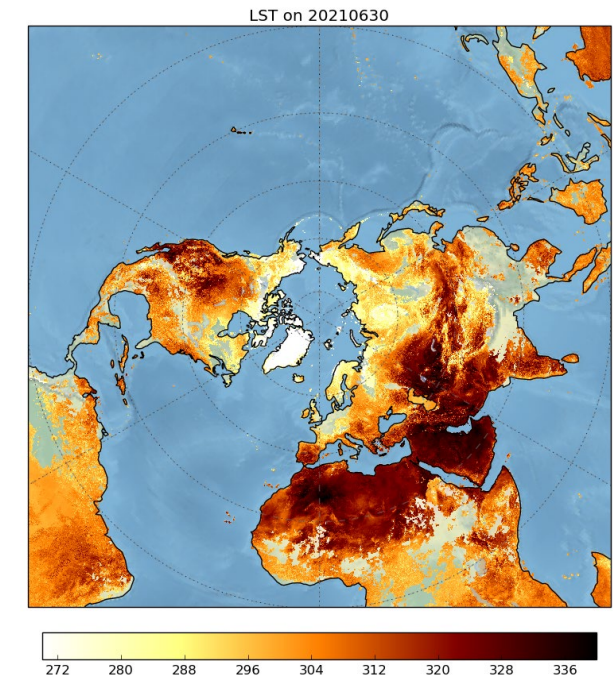
LST on 20210630

Heatwave in Southwest US and Western Canada

LST on 20210701

LST over Southwestern US
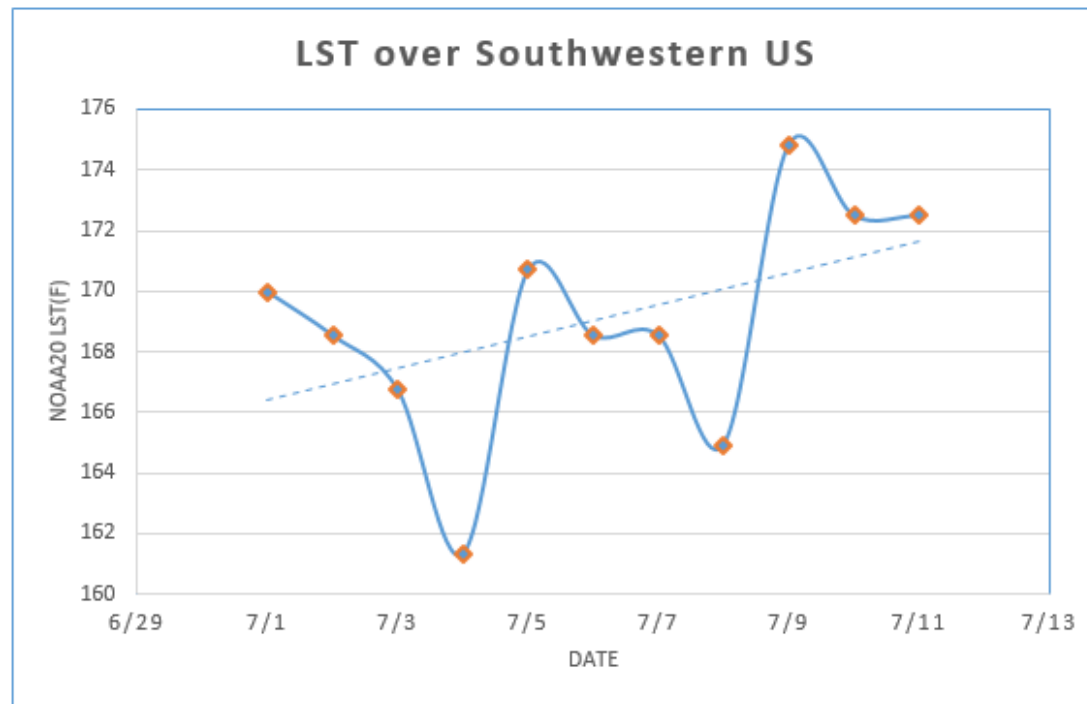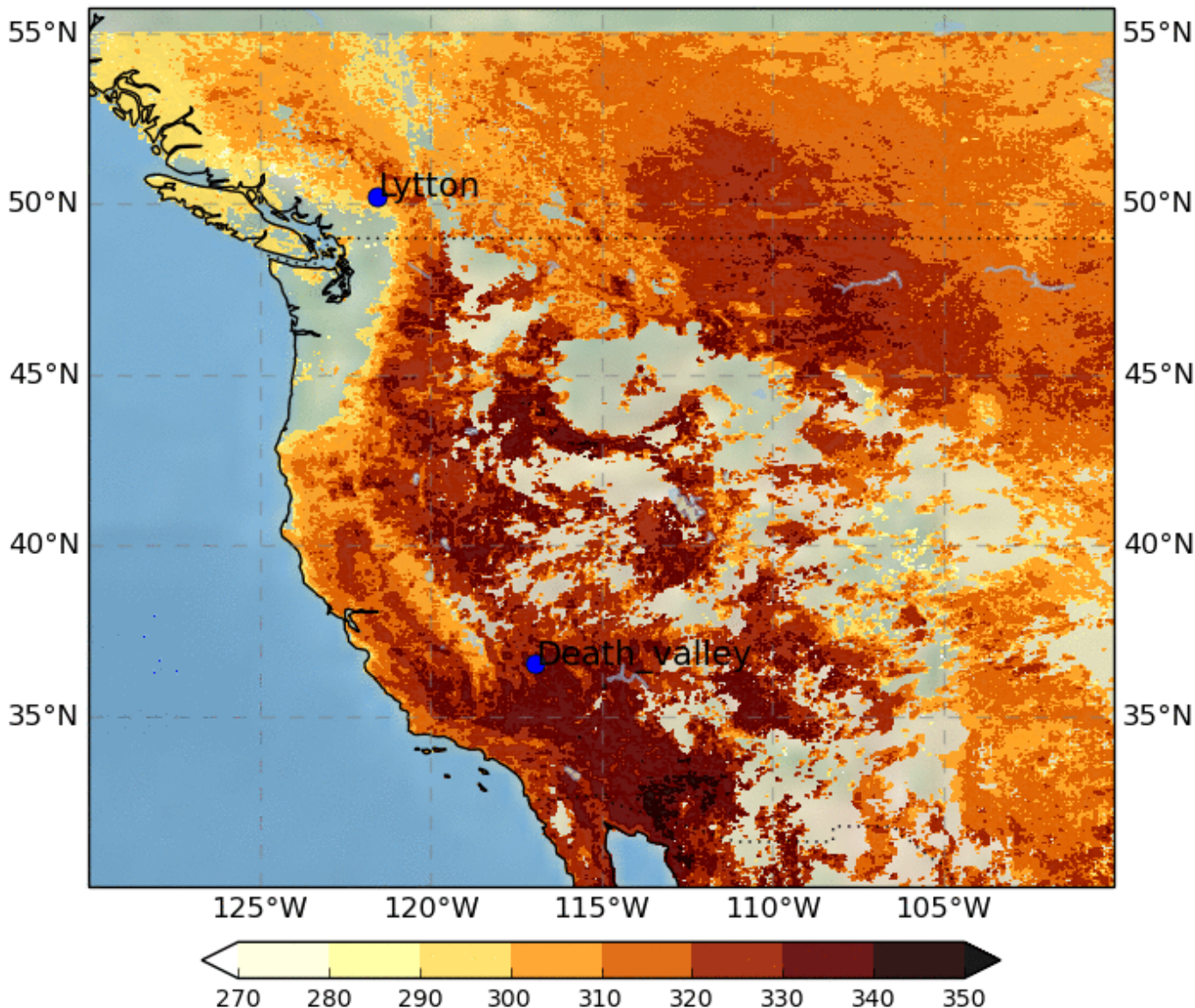
- It covers the area from 30N to 55N, and 130W to 100 west for July 1-11th, 2021
- LST is from the L3 NOAA20 LST with 1 km spatial resolution
- Upper right plot is the time series of regional maximum LST observed from satellite.

Heatwave highlight in death Valley

LST on 20210701
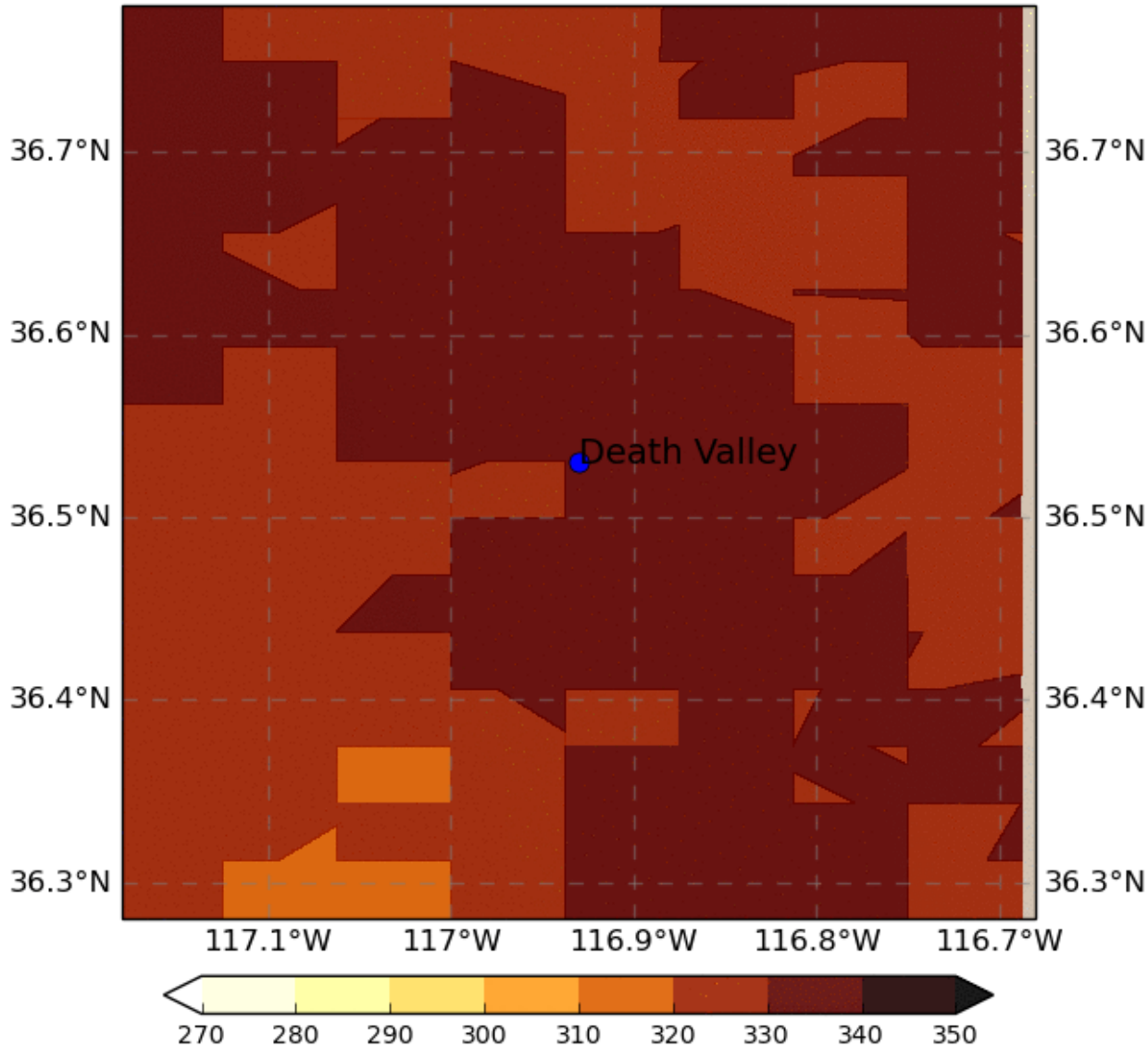
LST over Death Valley
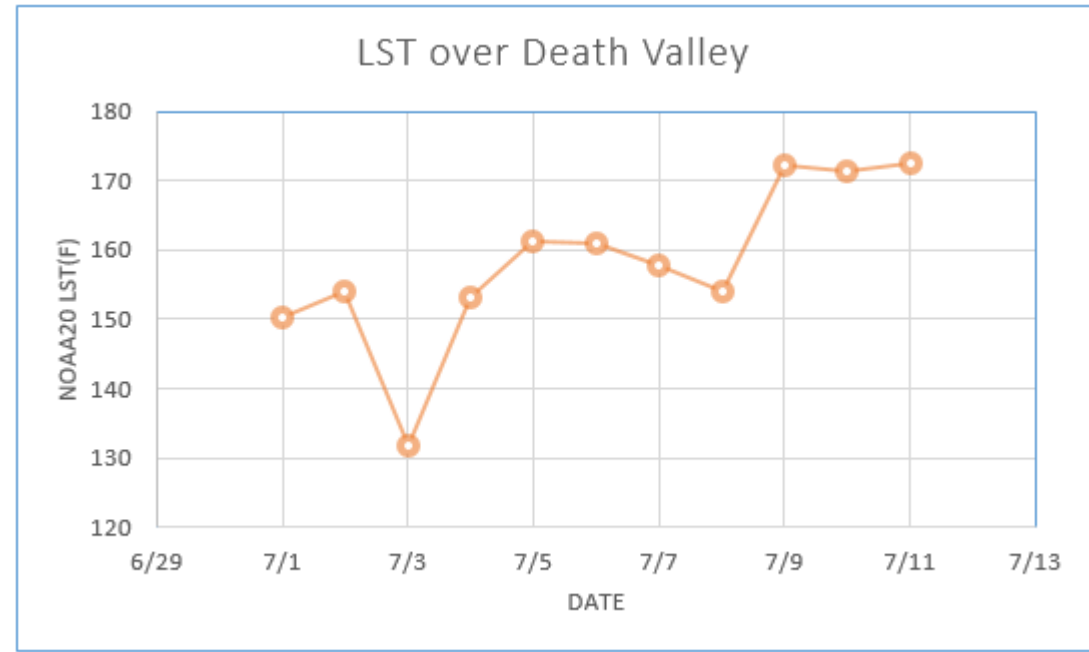
- 25 Km around death valley for July 1-11th, 2021
- LST is from the L3 NOAA20 LST with 1 km spatial resolution
- The time series indicates the maximum LST observed by the satellite. LST soars to 350 K (170.33F) for the dates between July 9 to 11th , corresponding to the air temperature reaching 130F (327.6K).

SNPP VIIRS daytime LST monthly anomaly: Jun, 2021
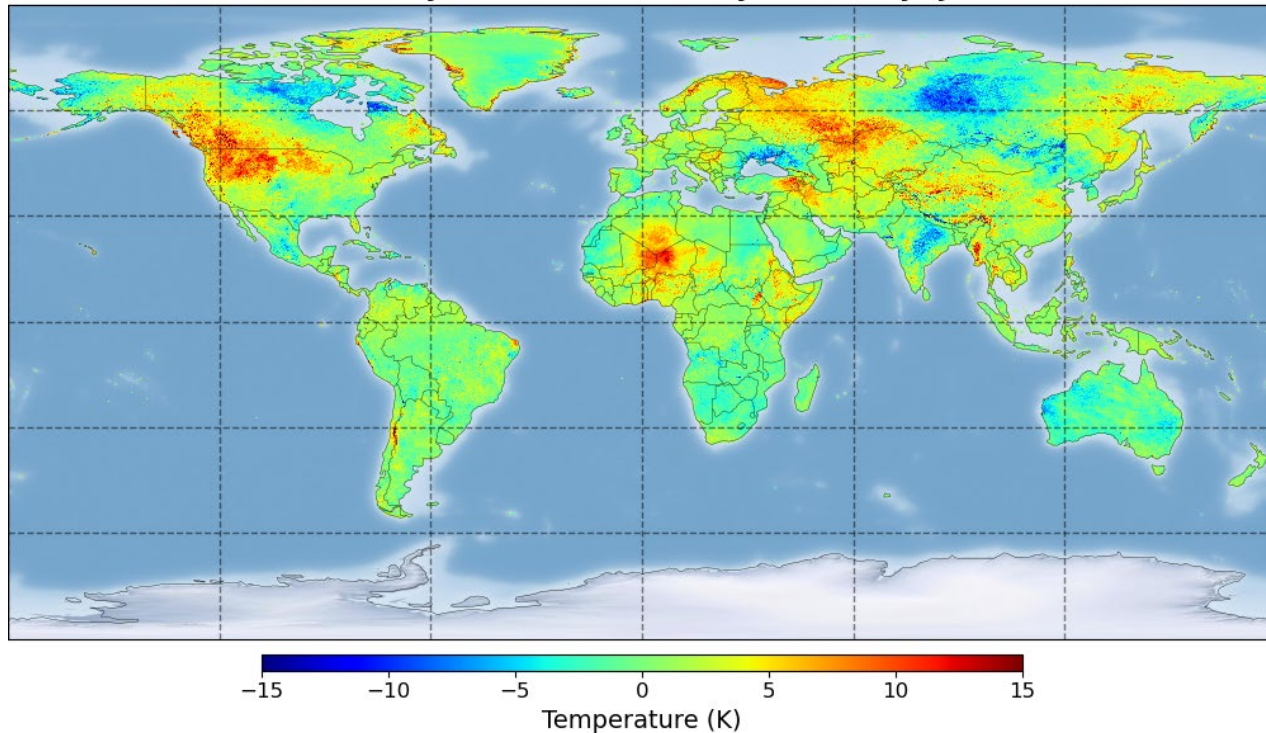
VIIRS daytime LST monthly climatology: June
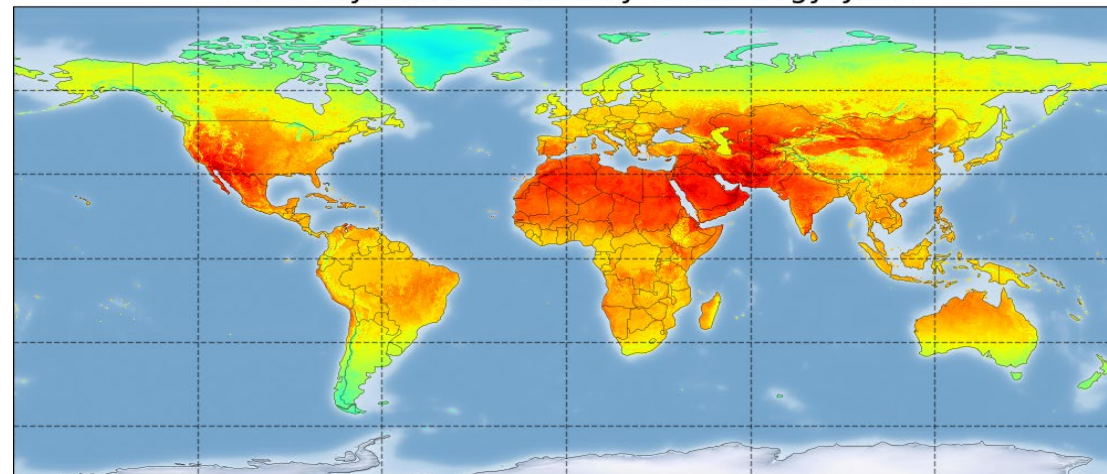
SNPP VIIRS daytime LST monthly average: Jun, 2021
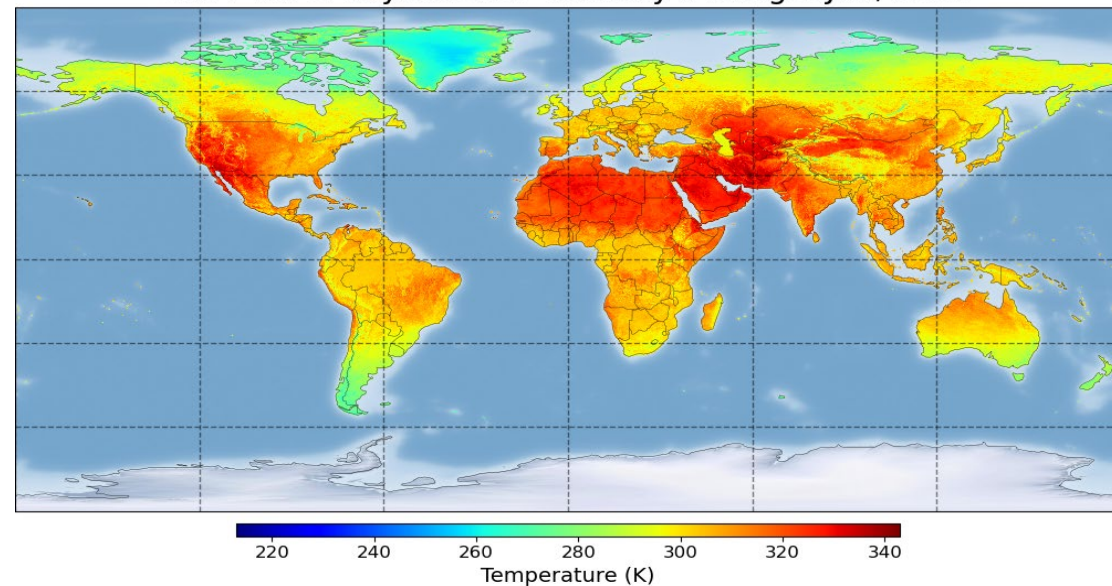
Compared to the past five years' climatology, three major heat events occurred in June 2021, at west of North America, West of Russia, and Northwest of Africa, respectively;

Central Russia is significantly cooler;

Simulation data uncertainty attributed to the interpolation

Comparison of BT11 (interpolated vs simulated)

SAMPLES: 4800
STD(K): 0.097
BIAS(K): 0.003
RMSE(K): 0.097
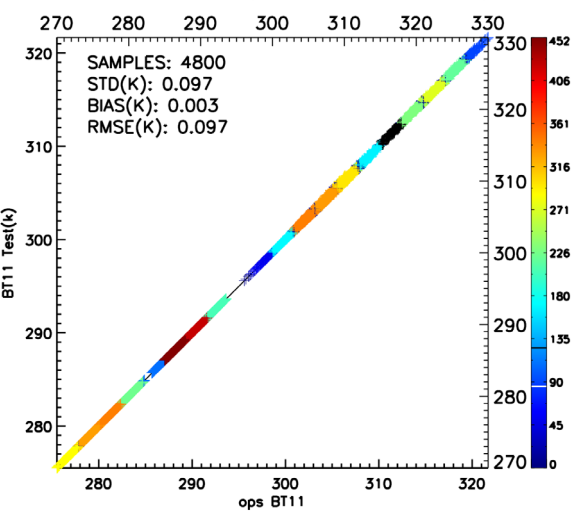
Comparison of BT12 (interpolated vs simulated)

SAMPLES: 4800
STD(K): 0.072
BIAS(K): −0.002
RMSE(K): 0.072
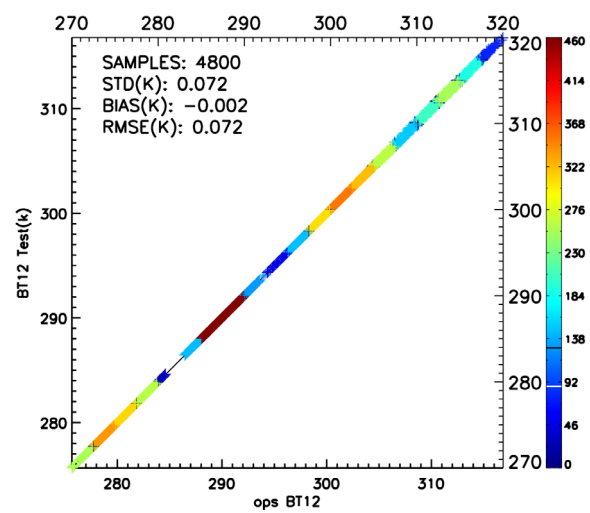
Comparison of BT11−12 (interpolated−simulated)

minDiff=−0.47
maxDiff=0.50

Comparison of BT11−12 (inte−simu) over stz
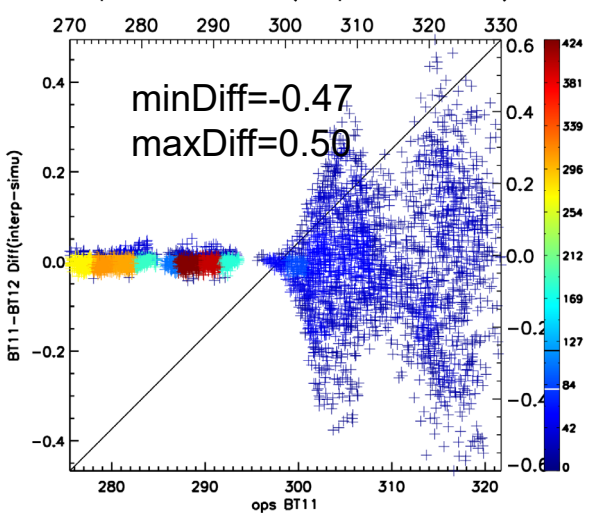
Comparison of BT11−12 (inte−simu) over Emis
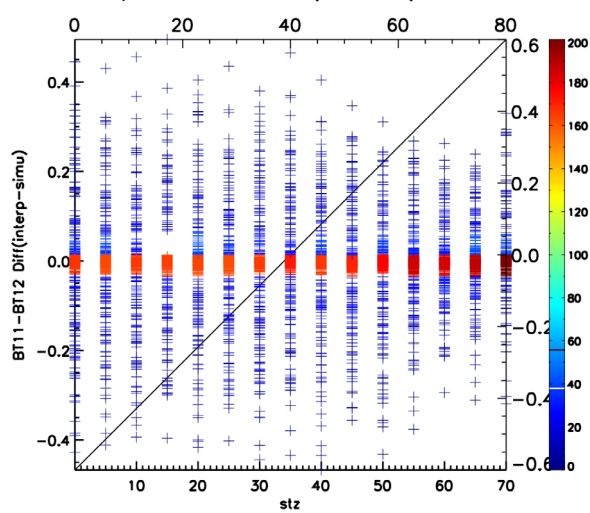
- Three random profiles are selected with cold, warm and hot temperature, respectively.
- Run MODTRAN simulation for emissivity in [0.95500,0.95875,0.96500 ,0.96875,0.97625,0.97875 ,0.98500,0.98875,0.99500 ,0.99875] and Ts in [ts-4,ts-3,ts-2,ts -1 ,ts+1,ts+2,Ts+3, Ts+4]

- The result is compared between the interpolated database and the Modtran output
- Top-left: BT11 and BT12 between the interpolated and MODTRAN output where "ops" represents the interpolated data.
- Bottom-left: the comparison of the BT difference (BT11-BT12) between interpolated and Modtran output

Findings

- More impact is observed for BT11 than BT12 according to the statistics
- The impact on the BT difference is unignorable with absolute maximum difference reaching up to 0.5 K according to the test results.
- The difference is generally higher under warm temp over 300K than that over cold temp.

Surface Albedo

Accomplishments / Events:

- Finalized the VIIRS BRDF climatology algorithm and start to process tile-by-tile (Slide 2-5)
  - Plotted the flowchart and the quality flag definition
  - Generated the climatology: the mean BRDF, std, Quality flags, and number of observations over three representative sample tiles
  - Optimized the output file structure for restrict the output size and contains necessary information
  - Selected the land and coastal tiles for BRDF climatology generation and tracking the processing progress
- Compared the VIIRS BRDF climatology and MODIS BRDF climatology
  - To assess the spectral response function influence and algorithm uncertainty
  - Support using the NASA VIIRS BRDF as climatology data source and reference value as what we did

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:

VIIRS BRDF climatology data, QF, and N_{obs} in h08v05

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
CalVal Report on current SNPP and N-20 data	Dec-20	Dec-20	Dec 20	
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/23/20	
Updated Cal/Val plan (address DPMS review comments)			04/28/21	
Initial J2 ready DAP to NDE (include NPP/N20 updates, ASSISTT delivery)	Jan-21	Mar-21	04/01/21	downstream testing
Initial J2 ready DAP to CSPP			05/26/21	
Final J2 DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Code developed for BRDF computation	Mar-21	Mar-21	Mar-21	
Snow albedo LUT and update	Apr-21	Apr-21	Apr-21	
Sample BRDF data evaluation comparing to MODIS data	Jun-21	Jun-21	Jun-21	
Annual algorithms/products performance report	Aug-21	Aug-21		
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		

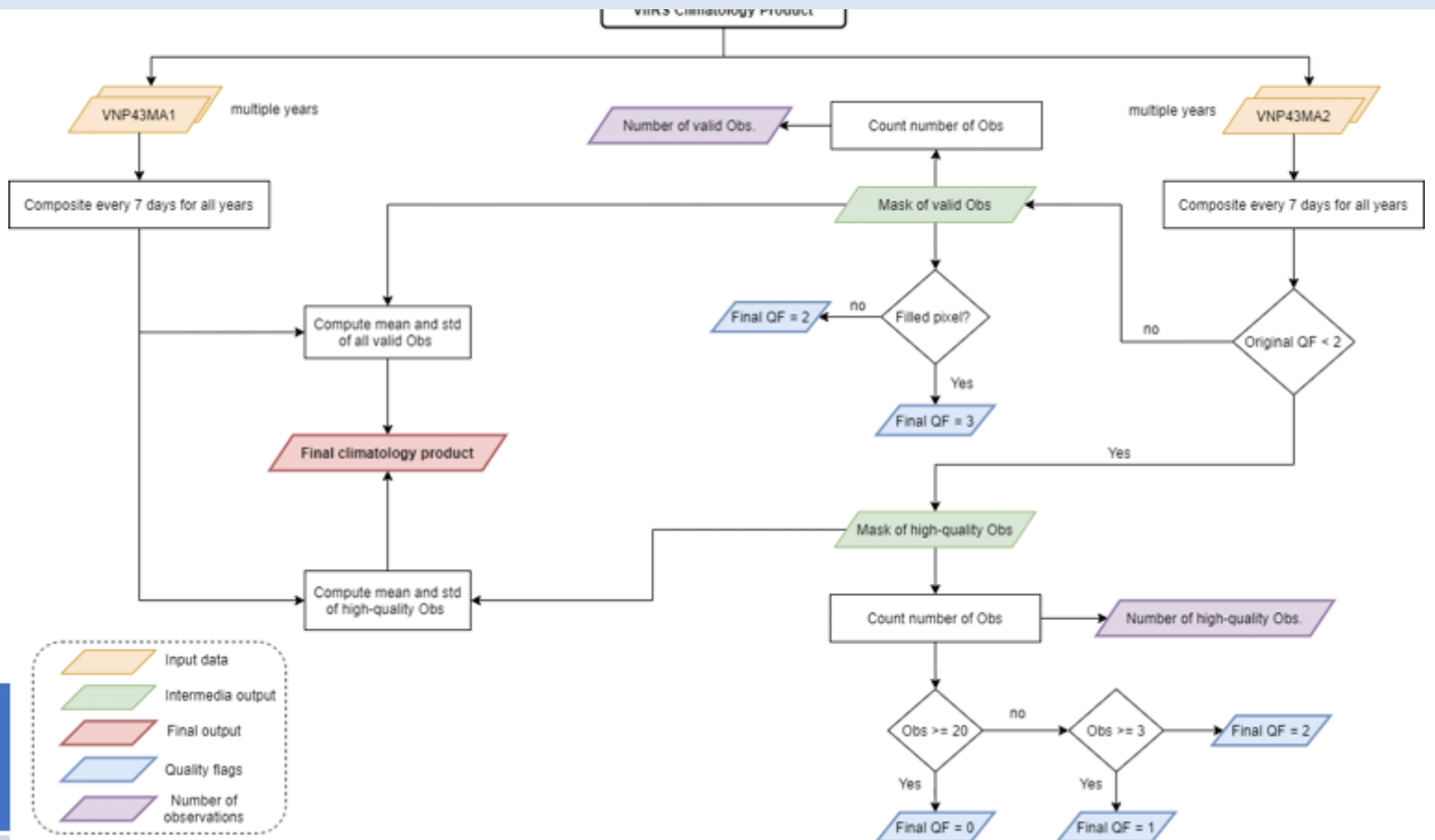# VIIRS BRDF climatology flowchart

VIIRS BRDF climatology will serve as the main input of VIIRS BRDF backup algorithm to provide constraints and fill value: the prior value and constraint of BRDF coefficients in the optimization when insufficient clear-sky surface reflectance observations collected; also, the fill value when no observations gained.

VIIRS BRDF climatology generation progress until this week

Note: ☐ : ROI   ■ : Finished   ■ : no data
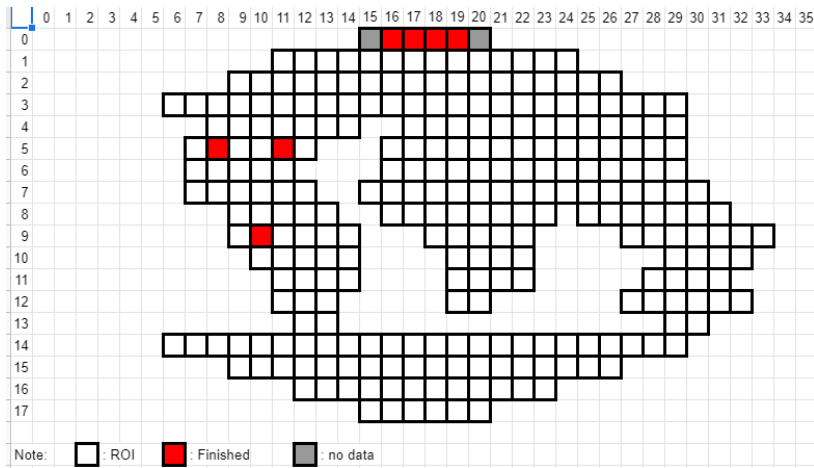
VIIRS BRDF climatology Size

	Raw Data per tile	Climatology per tile (.nc) netCDF4
Size	~200 GB	~20 MB
Details	(50M + 10M)*366*9	(55K) * 366

VIIRS BRDF climatology flowchart:

The finalized VIIRS BRDF climatology are composited mean, std, number of observation, and quality flags of BRDF values. The figures show the mean value of the three BRDF coefficients (f1, f2, f3) at nine bands in the tile over Amazon region, where high-quality retrievals are insufficient in most seasons due to the persistent cloud coverage.
The final climatology shows continuous distribution after employing all levels of retrievals, while the quality flag (showing in next slide) demonstrates which pixels are from high-quality retrievals, and which are from degraded retrievals.

H10V09 DOY: 4

f1

f2

f3
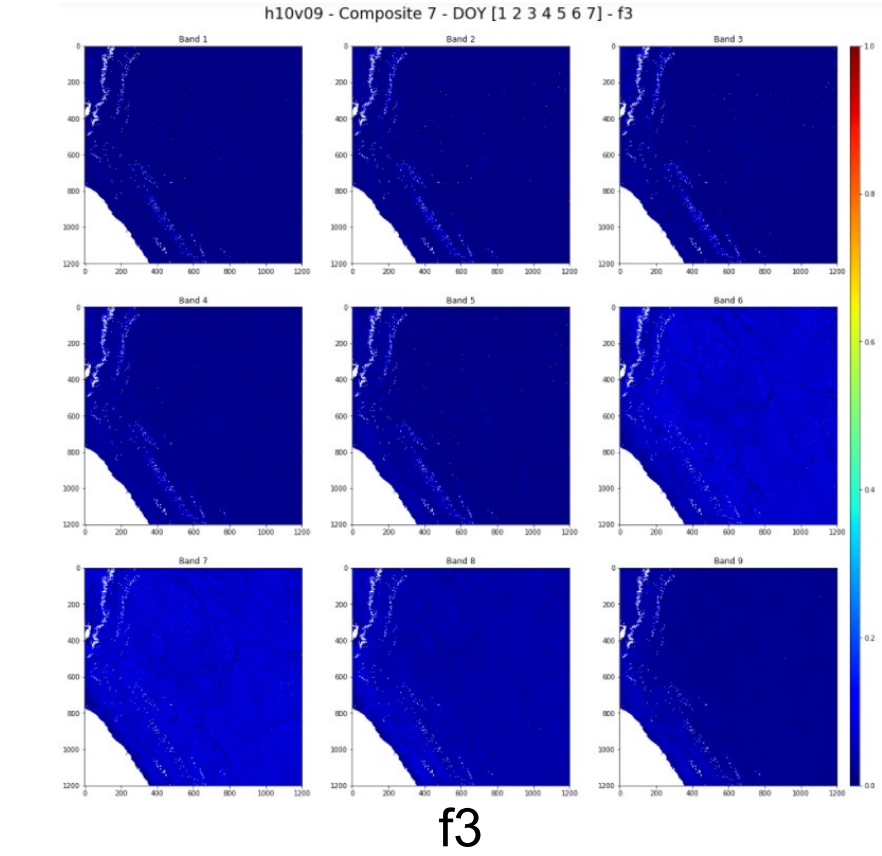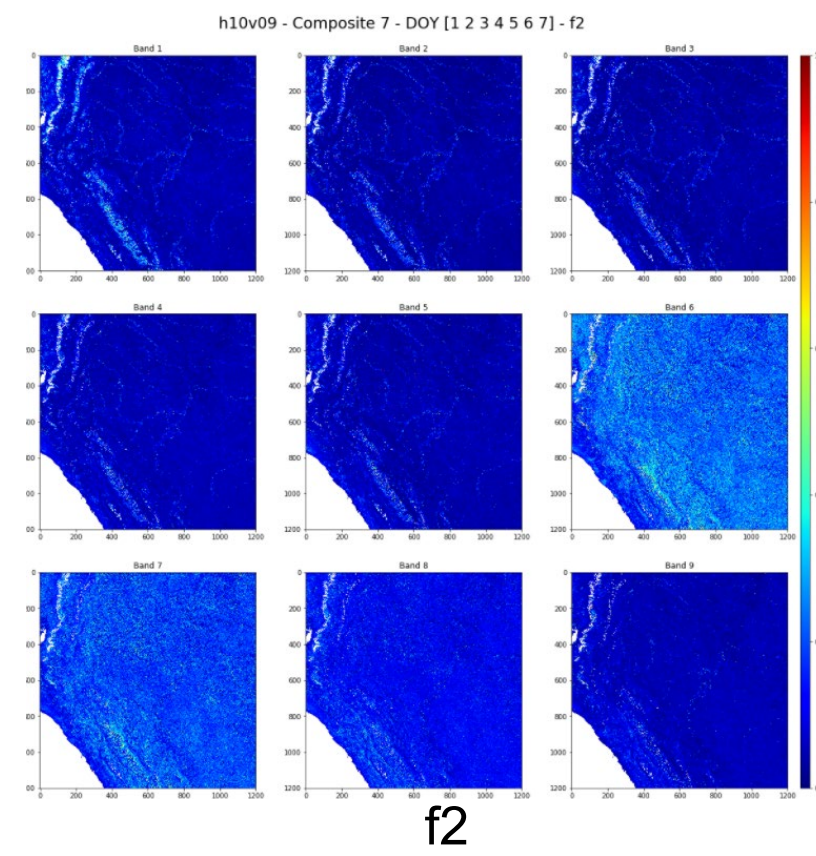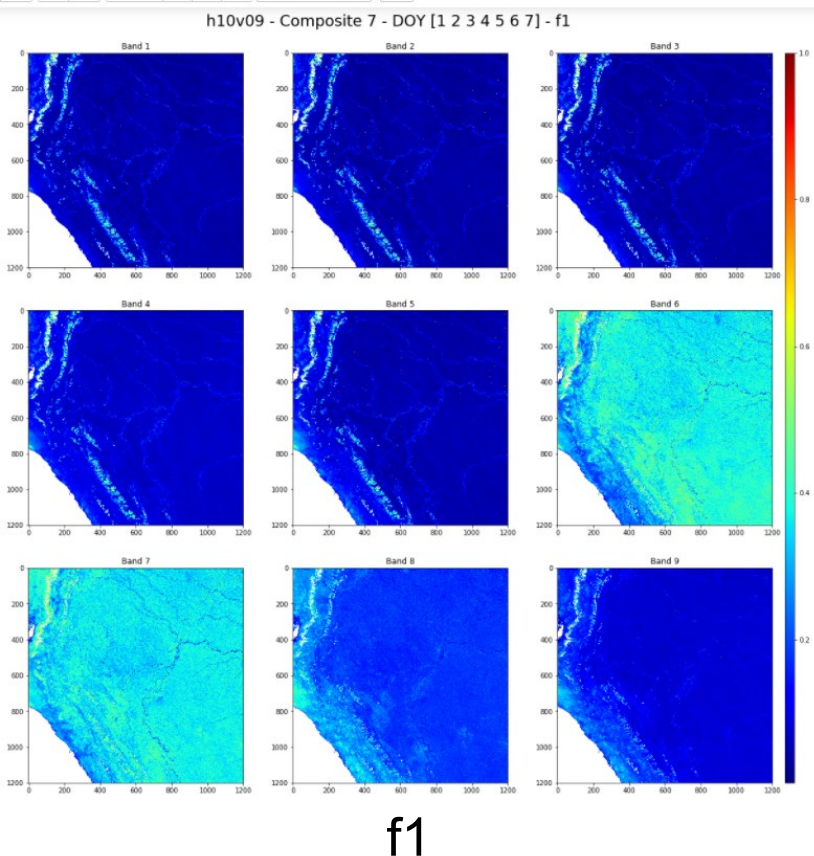
The table shows the detailed logic of the VIIRS BRDF climatology, and the figures show three test tiles representing various cloud influence degree different degrees of influence by cloud cover, regarding tile h08v05 (best quality) covers covering parts of California, Nevada and Arizona and plains, h11v05 (good quality) covering Midwest US, and h10v09 (lowest quality) over Amazon.

VIIRS BRDF climatology quality flag and generation criteria

Climatology QF	Criteria 1	Criteria 2
0	Valid Obs with QF < 2	Number of Obs > 20
1	Valid Obs with QF < 2	3< Number of Obs < 20
2	Valid Obs but not meet the above two	
3	Without any valid Obs	
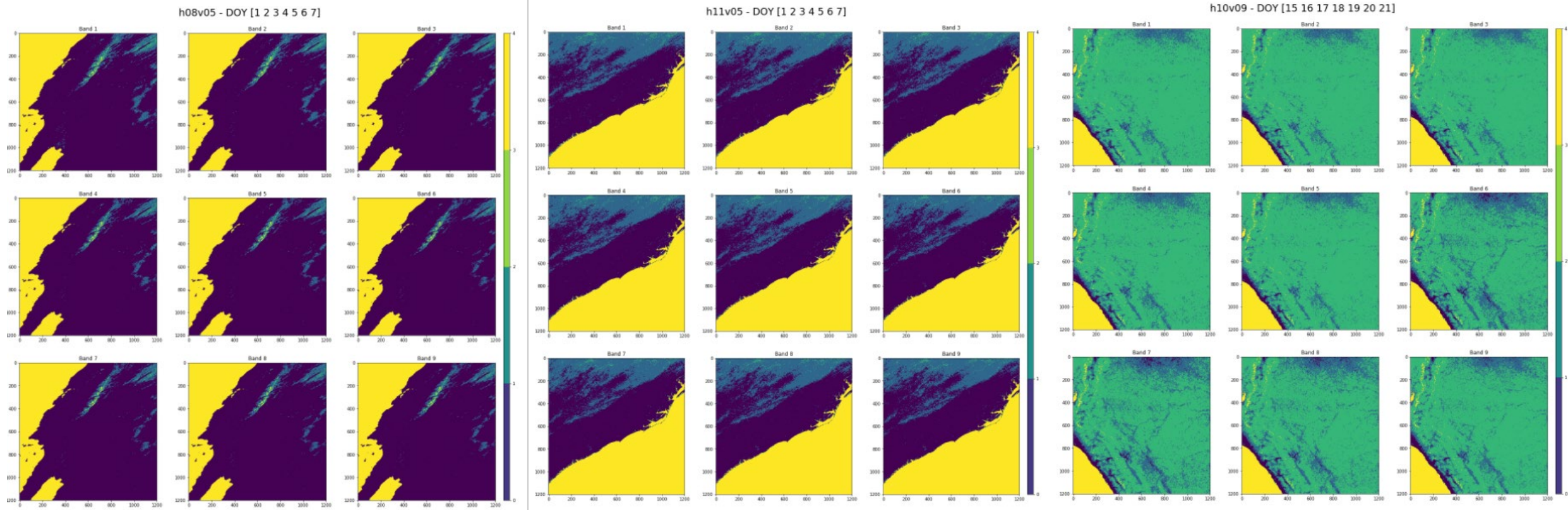
The below figures show the number of BRDF retrievals used in the three test tiles. This layer could explain the climatology quality flags and provides information for BRDF update using an incremental algorithm. The data is related to the available historical BRDF retrievals under cloud influence over each tile but not directly equal to, as it is also related to the screening of daily BRDF retrievals with quality flags.
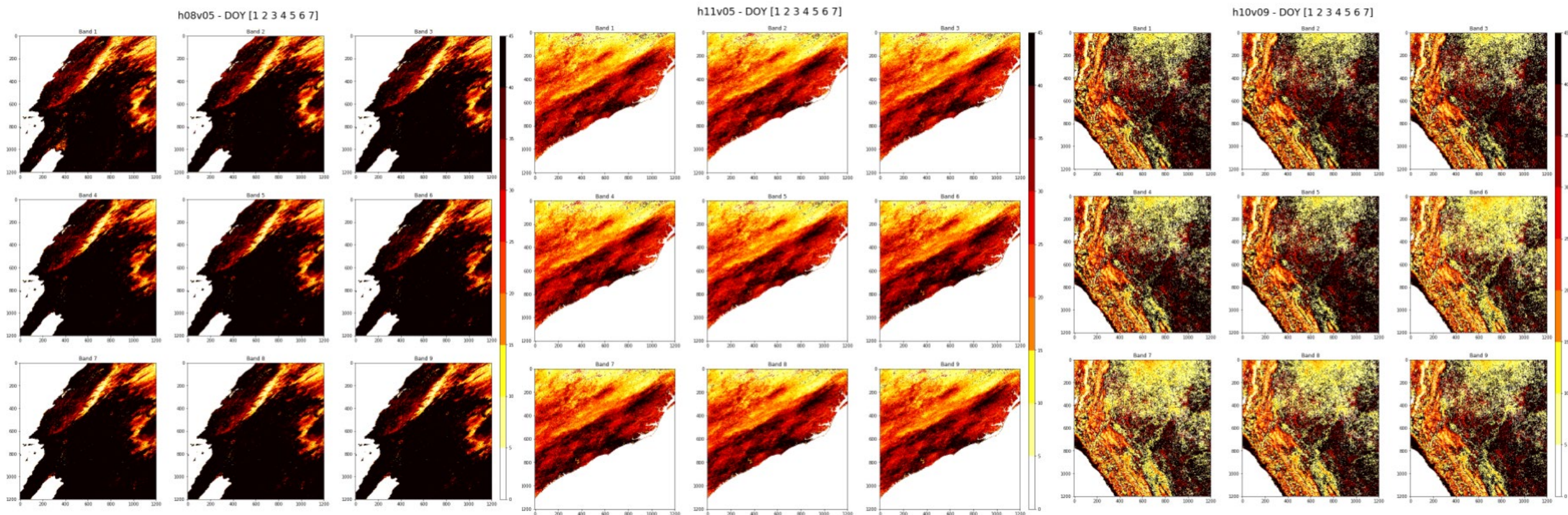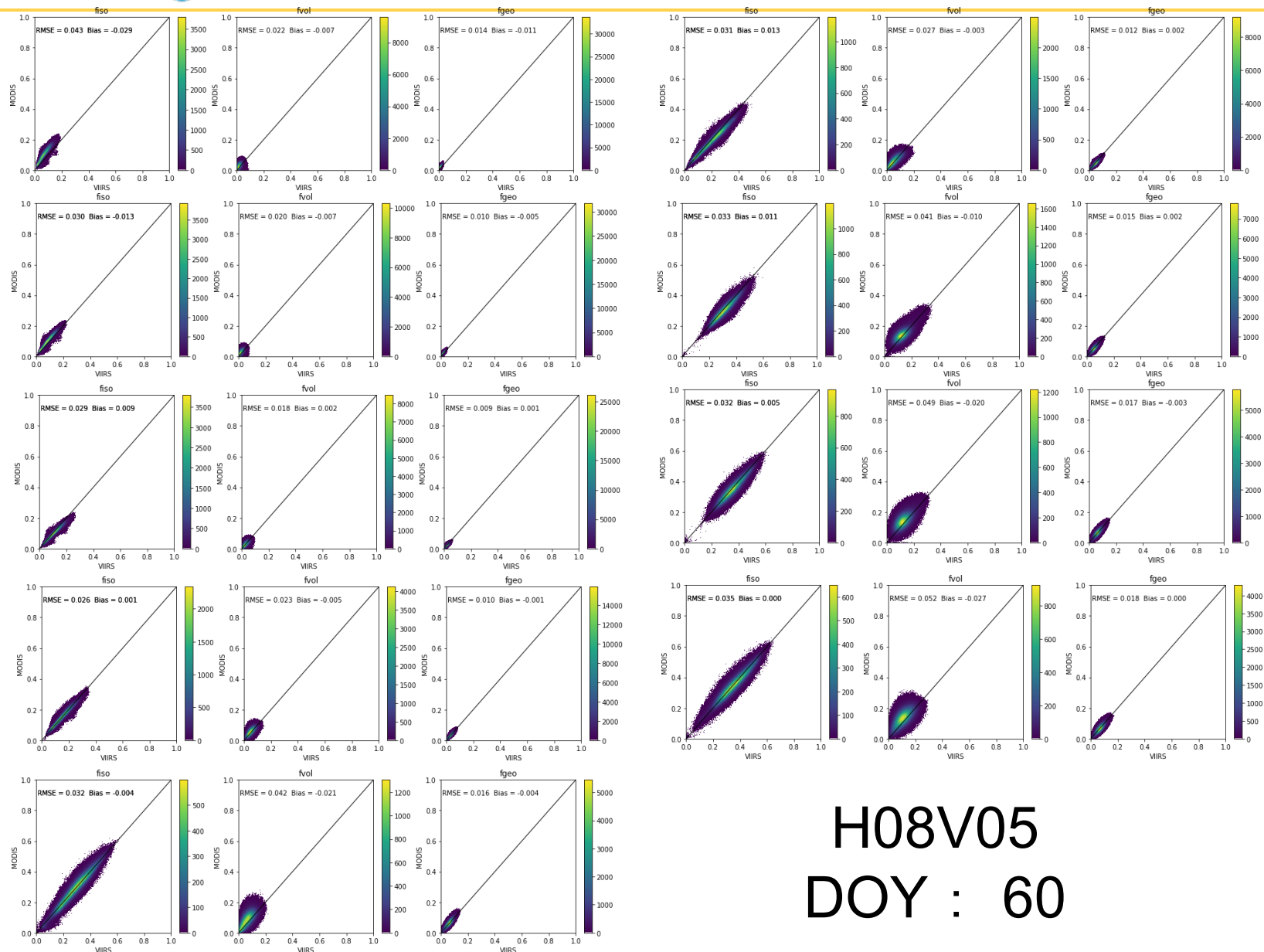
H08V05

DOY : 60

1. Comparison of the BRDF climatology between VIIRS and MODIS shows they are linearly consistent, especially the f_{iso} and f_{geo}. Some scattered difference could be observed due to the spectral response function difference and algorithm uncertainty under different observations.
2. Similar comparison trends are observed in other seasons with test data on DOY 152, 244, and 336.
3. This comparison suggests the VIIRS BRDF climatology could be more accurate to serve as input for backup algorithm.

Accomplishments / Events:

- Checked whether any effect of the June 2021 heat wave in the Pacific Northwest and western Canada was visible in any of the VIIRS vegetation products. No such effects were observed.
- Verified that final GVF products in global and regional cases produced GVF v3.0 and v2.3 are very close.
- Showed that discrepancies between v3.0 and v2.3 GVFs result from implementation sequence of filter function to screen out cloudy and high latitude pixels.
- Worked with intern to generate time series plots and correlations between 2020 VIIRS GVF, AVHRR climatology GVF, and 2020 PhenoCam Green Chromatic Coordinate.

Overall Status:

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

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

Issues/Risks:

None

Milestones

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

Green Vegetation Fraction (GVF) and differences, NOAA20
7 days beginning July 6 (after heat wave period)
Differences do not correspond to pattern of heat wave

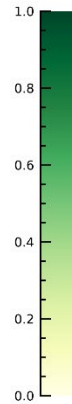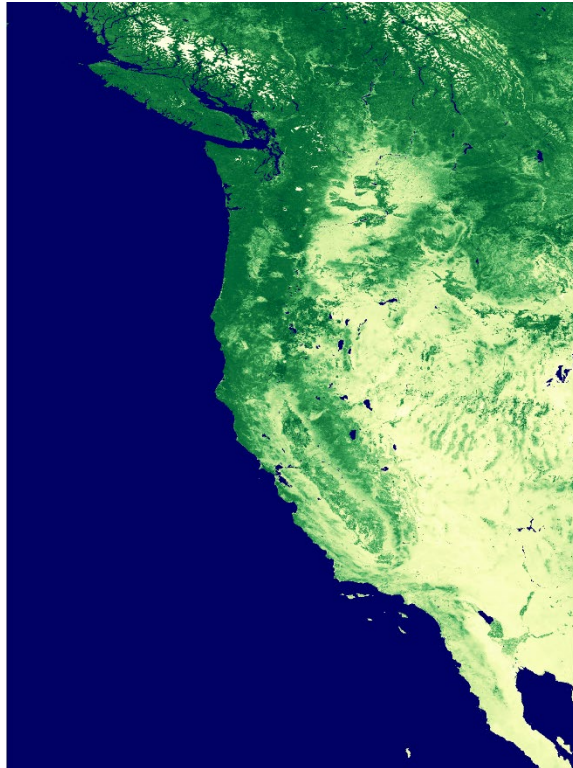2021   2020   2021 - 2020
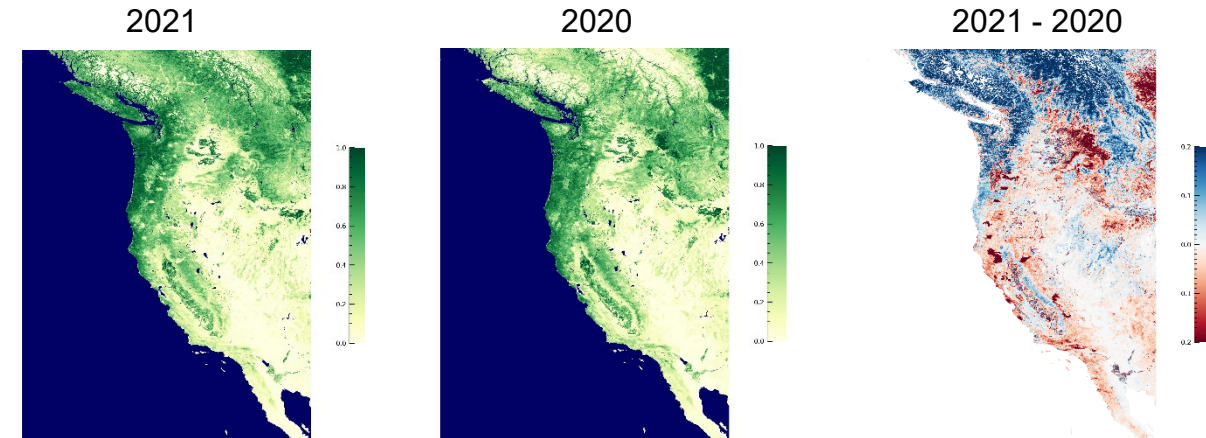
Vegetation effects from heat wave?

- A heat wave occurred in late June 2021, strongly affecting the western US, especially the Pacific Northwest, and western Canada.
- NDVI, EVI, and GVF were examined, comparing data from late June/ early July 2021 to the same dates in 2020.
  - Vegetation index (TOC NDVI and TOC EVI) data are from the 16 days beginning June 26.
  - Green vegetation fraction (GVF) data are from the 7 days beginning July 6.
  - 2021 data sets were compared to data from the same dates in 2020.
  - Images were produced for 2021 and 2020. Difference images were also produced.
  - Subsets of the regional (1km resolution) data were used, zooming in on the western US and southwestern Canada.
- Some decrease in vegetation parameters was seen in the western US, but vegetation indicators actually increased in western Canada.
- It is unclear that the heat wave had any effect on vegetation parameters.
- Data were used from both NPP and NOAA20. No significant difference was seen in the patterns of differences between the two satellites.

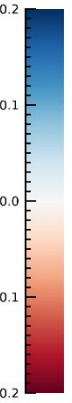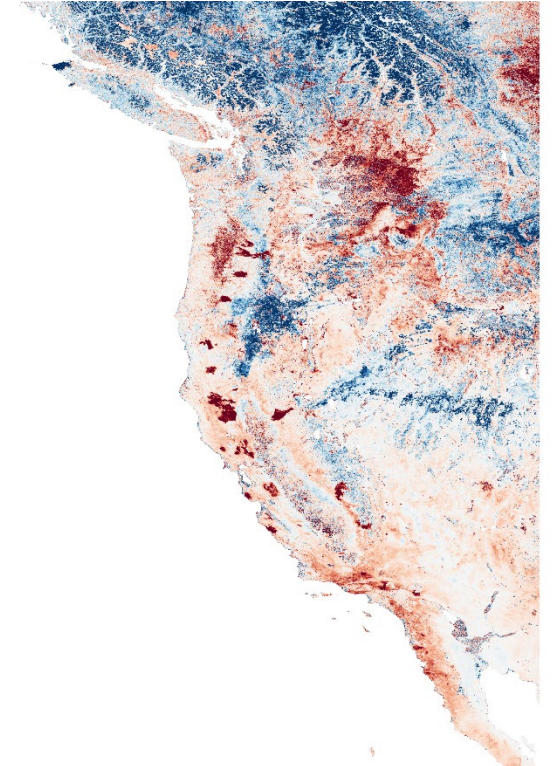# TOC NDVI and differences, NOAA20
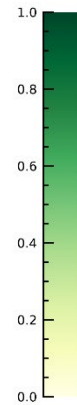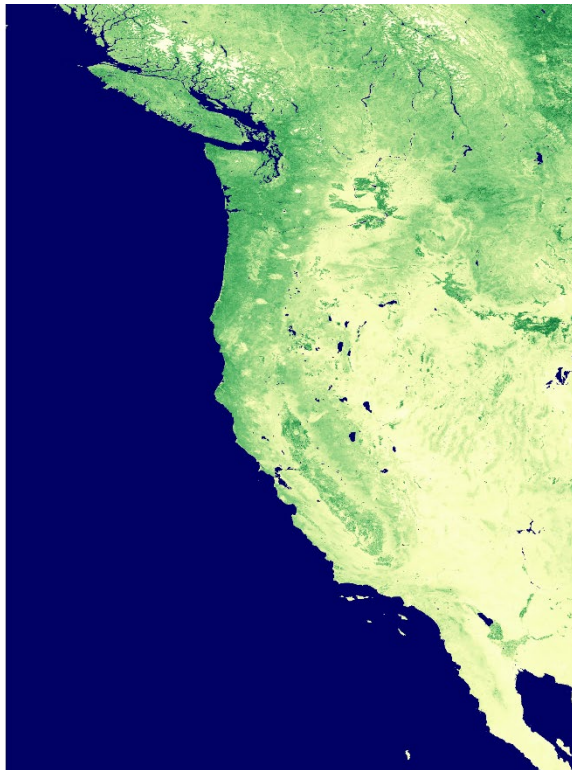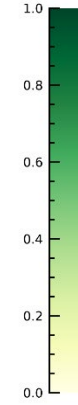# 16 days beginning June 26
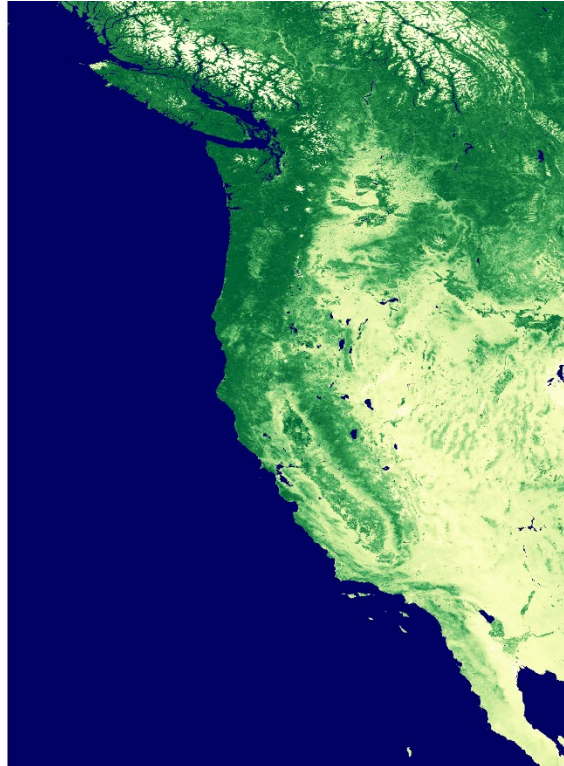
2021

2020

2021 - 2020

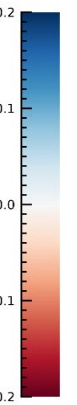# TOC EVI and differences, NOAA20
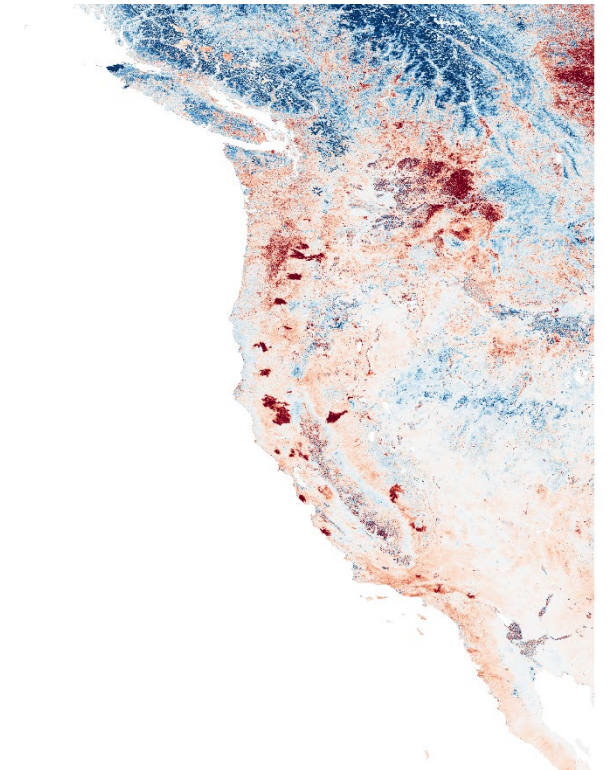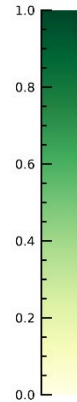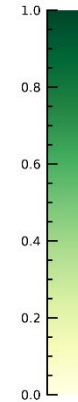## 16 days beginning June 26

2021

2020

2021 - 2020

Green Vegetation Fraction (GVF) and differences, NOAA20
7 days beginning July 6

2021

2020

2021 - 2020
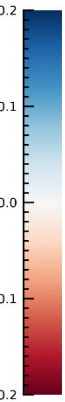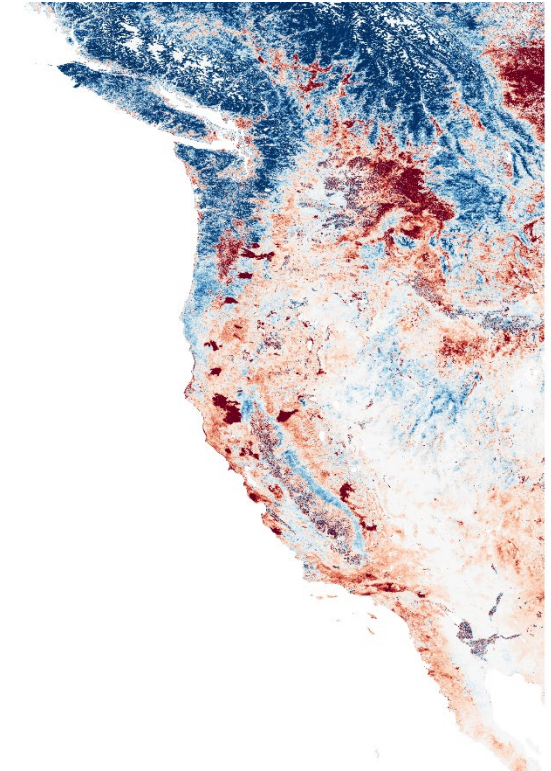
Global GVF comparison (v3r0 vs. v2r3)

GVF v2r3

NDE J01 VIIRS Weekly Green Vegetation Fraction Apr 1 - Apr 7, 2020

GVF v3r0

GVF regression test

Mean_diff=0.0066
RMSE=0.0319
R=0.993

Y=1.0366*X+0.0008
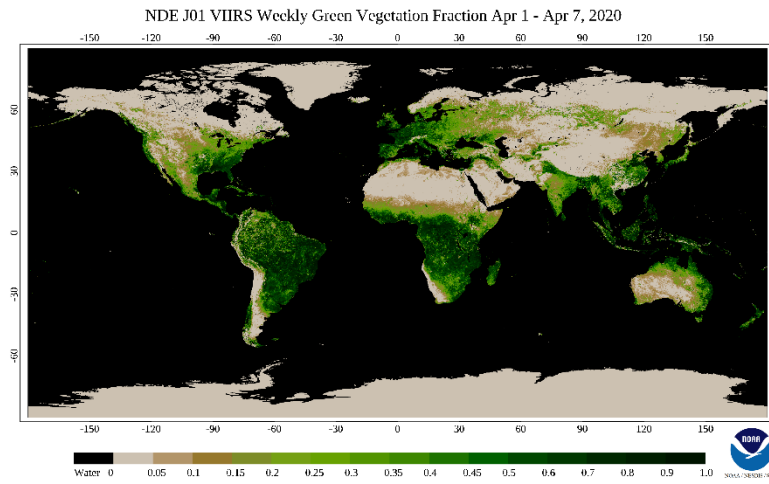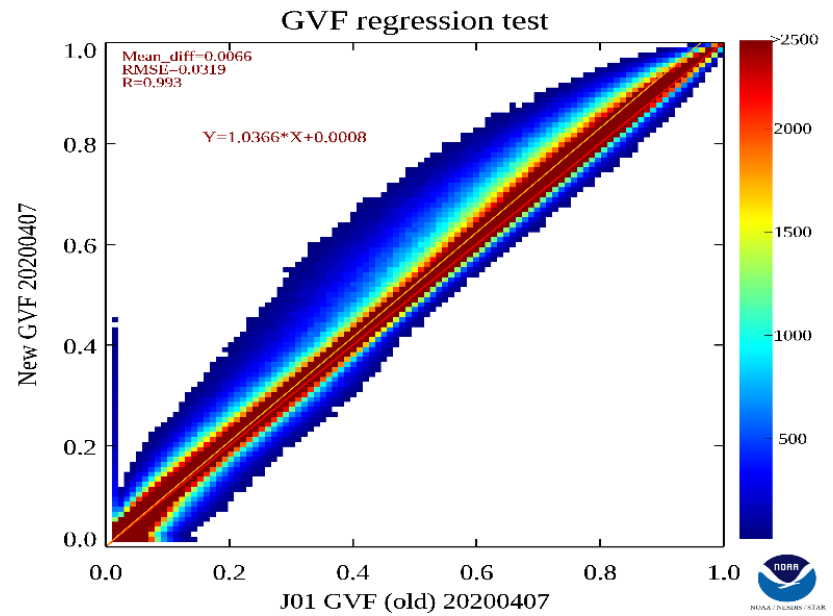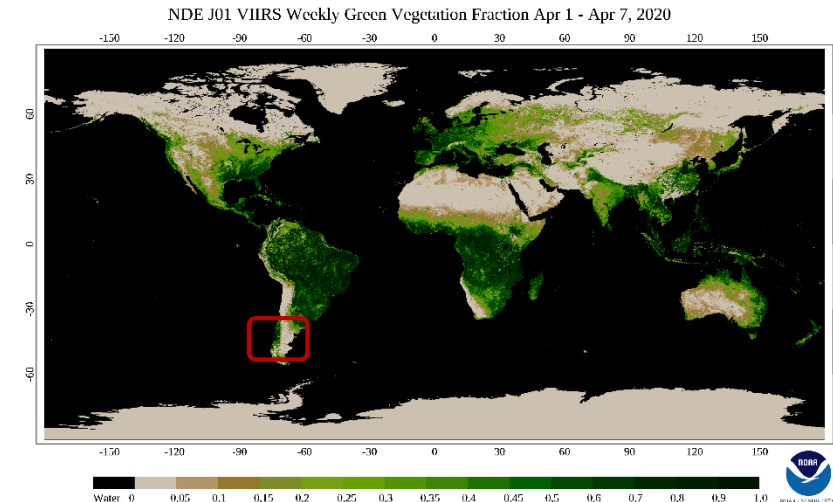
- GVF v3r0 is close to GVF v2r3 (RMSE=0.03, R=0.99)
- GVF V3r0 is slightly higher than GVF v2r3, particularly at Amazon area
- V3r0 GVF time series at Amazon seems more consistent than v2r3

Weekly global and regional GVF v3.0 versus GVFs v2.3
April 2-8, 2020

Weekly Global GVF
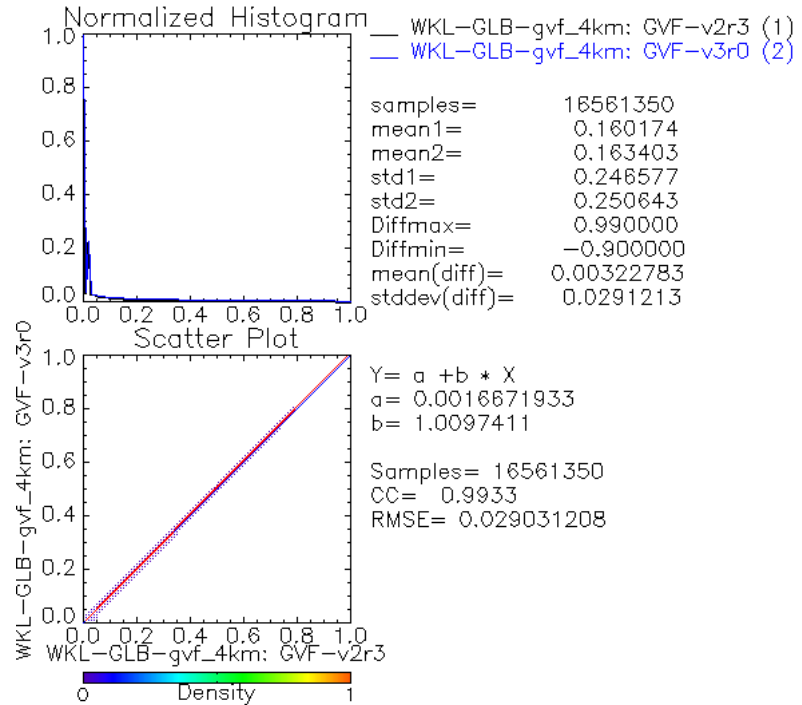
Weekly Regional GVF
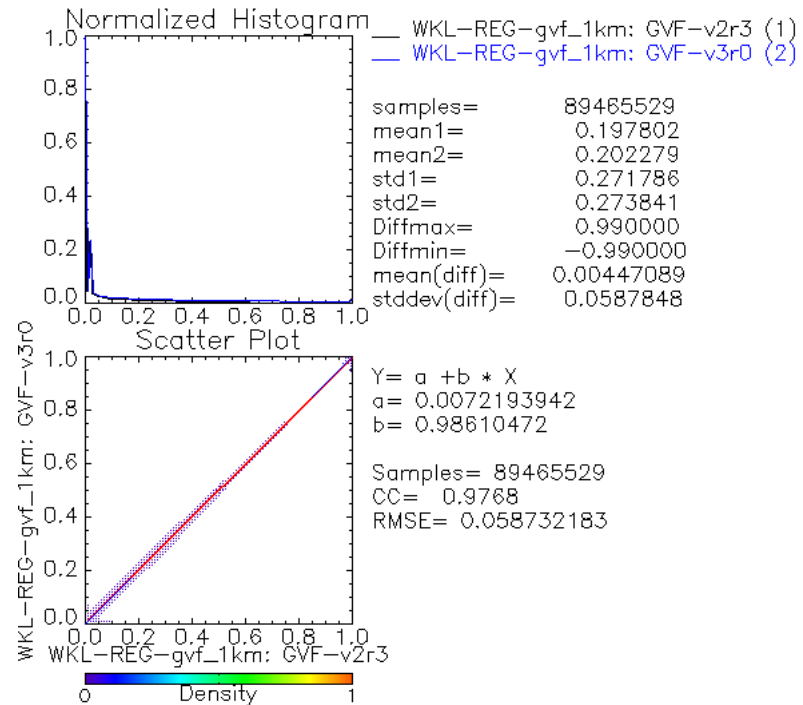
- Regression analysis verified means and standard deviations of differences between GVF v3.0 and GVF v2.3 in weekly global and regional cases are quite small
- The corresponding scatters showed both GVFs v3.0 and GVFs v2.3 distribute around diagonal lines

Diagnose the daily SR difference
(v2r3 GVF vs. v3r0 GVF)
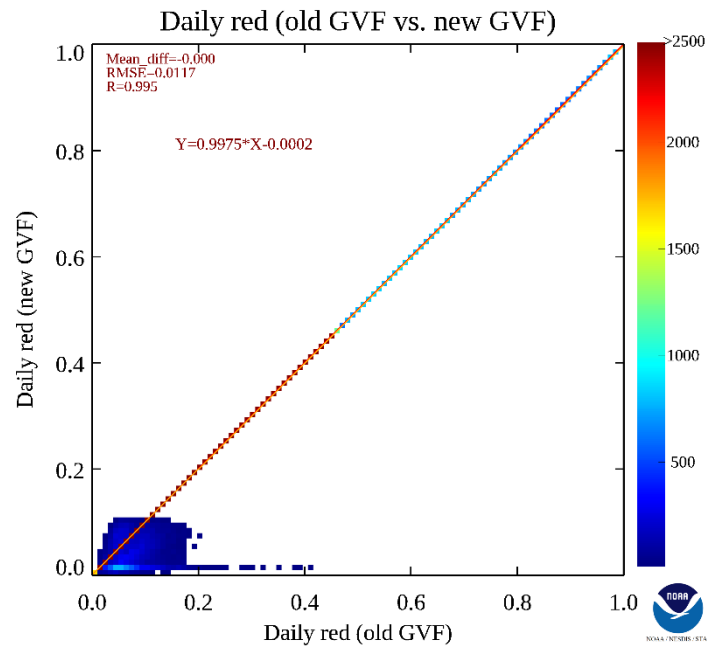
Before modification
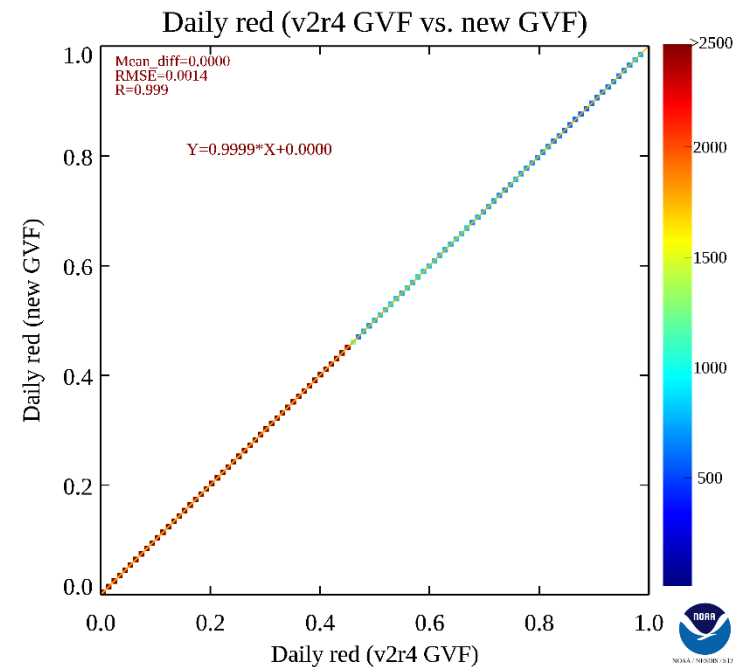
After modification

- In order to find the diagnose the difference between GVF v3r0 (new) and GVF v2r3 (old), the sequence of cloud filtering and gridding in GVF v2r3 is modified to be same as that of GVF v3r0
- After modification, the old and new daily surface reflectance are almost identical

Finding:

1. **The difference in the sequence of gridding and cloud filtering explained the daily SR difference between V2r3 and v3r0**
2. **The only difference between GVF v3r0 and GVF v2r3 is the gridding and cloud filtering sequence difference**

Daily Surface Reflectance (SR) from GVF v3r0, GVF v2r4, and GVF v2r3 using April 4, 2020 NOAA-20 VIIRS data

- GVF v3.0 uses daily SR from VI v2.1 as inputs and thus saves 2+ hours to do daily gridding process compared to GVF v2.3.
- GVF v3.0 implemented a filter function to screen out cloud and high latitude gridding points after the gridding process while GVF v2.3 did that at granule pixels before gridding process.
- In order to verify the discrepancies between GVF v3.0 and GVF v2.3 result from their different implementation sequence of the filter function, we modified code of GVF v2.3 to generate GVF v2.4 in which the filter function was implemented after gridding process.
- The tests of GVF v3.0, v2.3, and v2.4 with NOAA-20 observations in the period of April 1-16 of 2020 showed that daily SR data from GVF v2.4 are completely consistent with those from GVF v3.0 but a little different from those from GVF v2.3.
- This verifies that the difference in sequence of screening and gridding is the cause of the v3r0 versus v2r3 GVF differences.

GVF v2r4 vs GVF v3r0
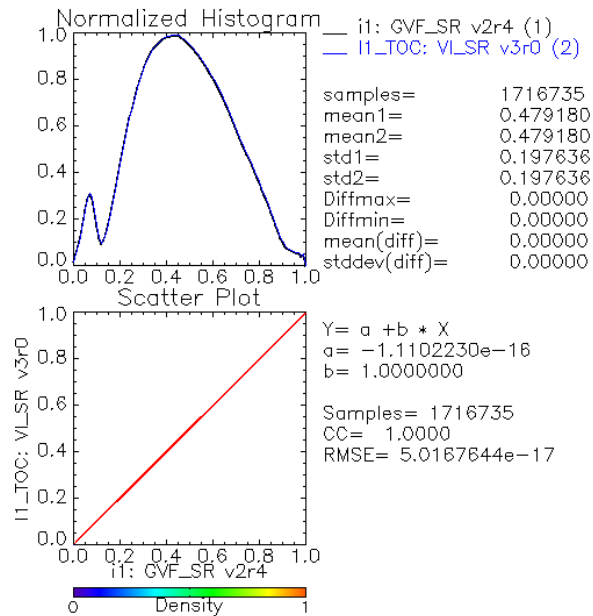
GVF v2r4 vs GVF v2r3
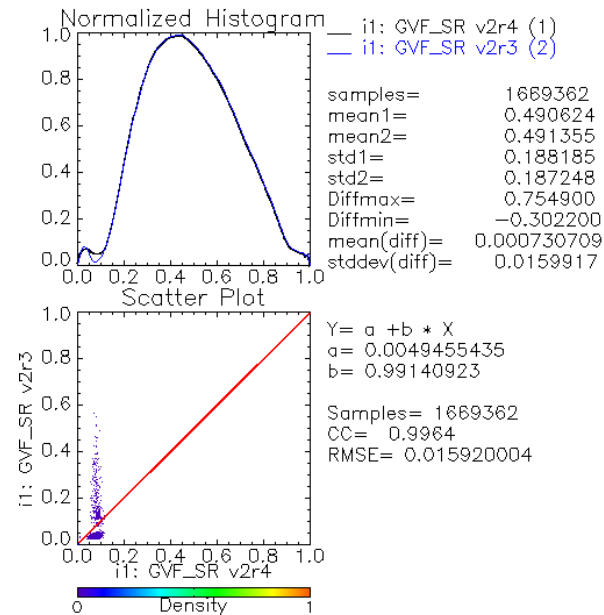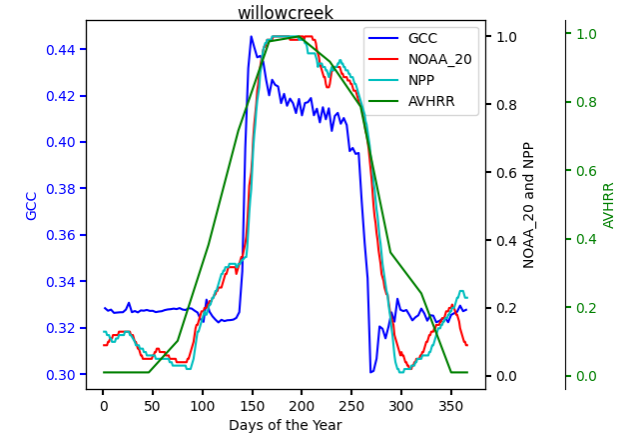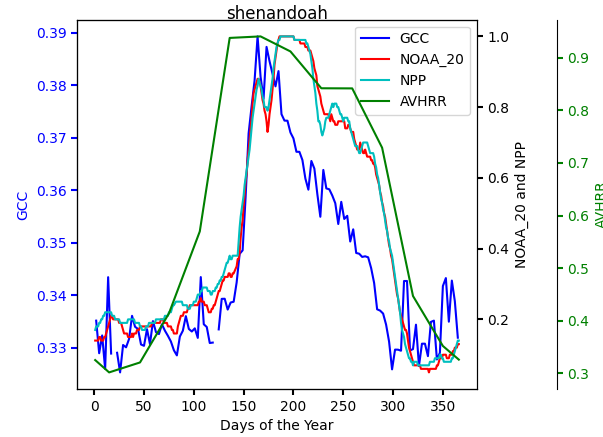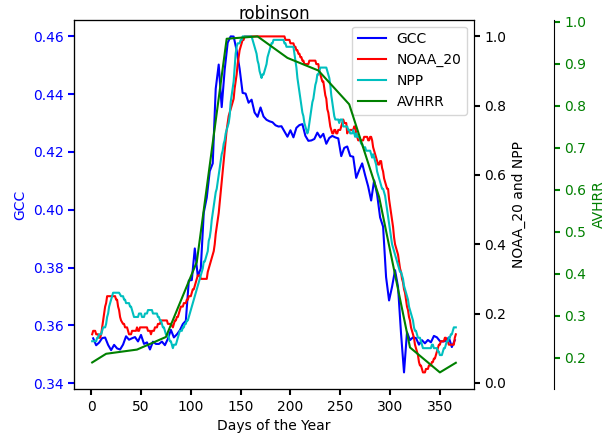
Correlation Table

Dataset	Correlation Values
GVF_NOAA_20	0.91
GVF_NPP	0.93
GCC_AVHRR	0.94

Dataset	Correlation Values
GVF_NOAA_20	0.88
GVF_NPP	0.87
GCC_AVHRR	0.81

Dataset	Correlation Values
GVF_NOAA_20	0.9
GVF_NPP	0.88
GCC_AVHRR	0.93

Vegetation Health

Accomplishments / Events:

- Worked with ASSISTT for 1) an updated version of production code, suitable for latest version of compilers and latest regulations; also updated the code for operational running on different platforms; 2) removal of obsolete ancillary files in the DAP package;
- Kept on updating locust activity with regards to vegetation health indices (Highlighted), note the field data of locust distribution would be delayed for roughly a month, so here we show figures of June, instead of July;
- Worked on drafting a new manuscript on locust activity vs VH indices;
- Generated a series of data and figures of VIIRS/VHP-1 and -4, -16 km resolution products, covering July 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	Sep-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: Re-Compositing Paper Published

VHI Jun 2021
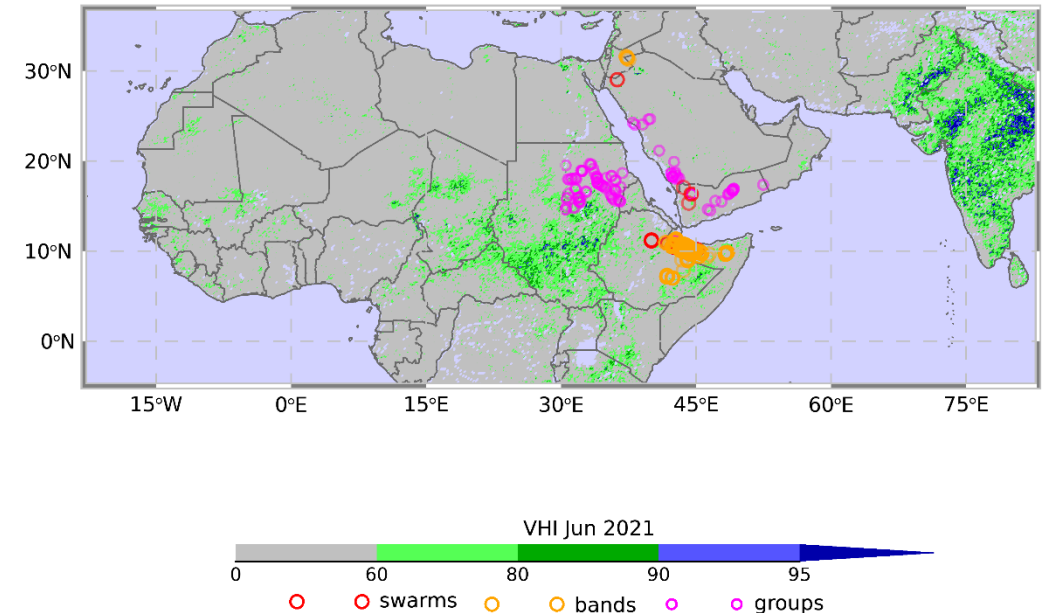
Ocean Color

Accomplishments / Events:

- Ocean Color team presented SDR Calibration methodology and status to JSTAR program management and VIIRS SDR Calibration team at a collaboration meeting on 8 June 2021 as part of an effort to ensure there is no duplication of effort across the teams and to increase sharing of lessons learned.
- OC Team at NRL continues to work Aeronet-Ocean Color operations and monitor SNPP and NOAA-20 performance at WavCIS. They also provided the OC NOAA Team with an overview of their 2021 NOAA Cal/Val Cruise support from earlier this year. They are currently troubleshooting issues discovered at the WavCIS site.
- OC Team at CCNY continues to compare VIIRS OC with in-situ reflectance data for several type of water conditions. They report that in many cases the 671 nm band on SNPP-VIIRS looks biased high in comparison with GER and WaveCIS data for coastal waters. This is being investigated.

Overall Status:

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

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

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	01/19/21	
Updated Cal/Val plan (DPMS comments)			04/29/21	
Update MSL12 LUTs and various coefficients for J-2	Jun-21	Jun-21	Jun-21	
Complete testing/verification of J-2 OC data processing	Sep-21	Sep-21		
Final J2 ready DAP delivery (include NPP/N20 updates) to CW	Dec-21	Dec-21		cc ASSISTT
Complete MSL12 v1.40 preparation and implementation	Jun-21	Jun-21	Jun-21	
Working on improvement of the ocean color data processing system (MSL12), particularly over global coastal and inland water regions	Sep-21	Sep-21		
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: Capabilities for Ocean Color Cal/Val Cruise Planning from NRL supporting 2021 cruise.
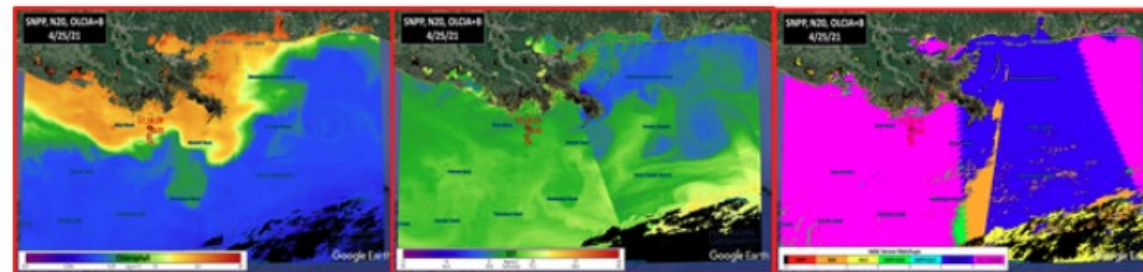
Daily near-real-time merged SNPP, N20, OLCIA and OLCIB satellite images from April 25, 2021 provided to ship for planning (chlorophyll-left, Sea Surface Temperature-middle, valid sensor matchups-right). Images were displayed in Google Earth and stations for the day were overlaid.

Sea Surface Temperature

Accomplishments / Events:

– STAR produces two global 0.02° gridded super-collated Advanced Clear Sky Processor for Ocean (ACSPO) SST products from two families of low earth orbiting (LEO) satellites: L3S-LEO-PM from NPP/N20 VIIRSs, and L3S-LEO-AM from Metop-A/B/C. This is the first global L3S product ever.

– As a part of their Cal/Val and documentation, and by request from the Australian Bureau of Meteorology (BoM), ACSPO L3S-LEO imagery was compared with the similar L3S regional product produced for waters around Australia under the Integrated Marine Observing System (IMOS).

– Note that BoM/IMOS L3S super-collates 1km resolution AVHRR Hi-Res Picture Transmission (HRPT) from NOAA-18/19, Metop-FG data from EUMETSAT, and NPP/N20 VIIRS SSTs.

– Results of comparisons were shared with BoM/IMOS colleagues. Figure shows an example on 6 Dec 2017 over the Northern New South Wales region. Both L3Ss provide a comparable coverage, while the ACSPO L3S-LEO shows significantly fewer and smaller artifacts due to residual cloud and stitching imagery from different satellites and overpasses

– Work with BoM/IMOS partners will continue to extend the comparison to include quantitative metrics, and to better understand and resolve the differences.

Overall Status:

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

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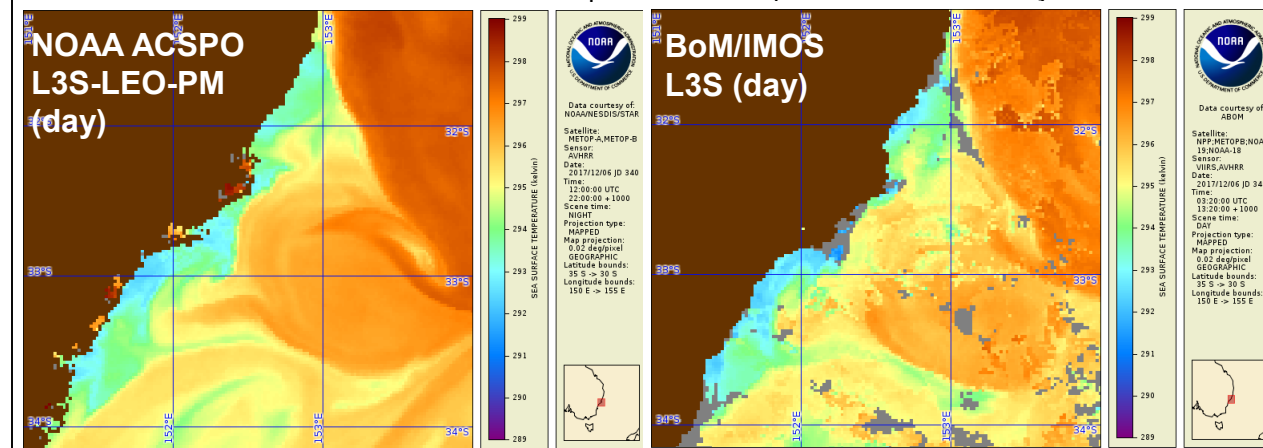4. *Project has fallen significantly behind schedule, and/or significantly over budget.*

Issues/Risks:

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

Highlights:

– Left: ACSPO L3S-LEO-AM (from Metop-A/B/C) on 6 Dec 2017 over Northern New South Wales
– Right: Regional Australian BoM/IMOS L3S over the same region on the same date
– Note more smooth ACSPO L3S imagery (fewer cloud leakages and discontinuities)
– Work w/BoM/IMOS continues to extend to quantitative comparisons and eventually reconile

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	Aug-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		Will be omitted because 2.80 is initial and at the same time final J2-ready DAP
Improved clear-sky mask, SST fronts to support data fusion (ACSPO 2.90)	Aug-21	Aug-22		Next ACSPO version will be J2-tweaked
J2 ACSPO and Cal/Val Readiness	Sep-21	Oct-21		Delayed by expired CAC cards
Support N20/NPP SST Cal/Val & fixes	Sep-21	Oct-21		Delayed by expired CAC cards
Continue archival w/PO.DAAC/NCEI. Work w/NCEI to complete holdings	Sep-21	Oct-21		Delayed by expired CAC cards
Maintain SQUAM, iQuam, ARMS, match-up codes, RAN infrastructure. Improve and optimize	Sep-21	Oct-21		Delayed by expired CAC cards
NOAA SST Cal/Val Tools ready to monitor N21 SST	Sep-21	Oct-21		Delayed by expired CAC cards
Annual algorithms/products performance report	Sep-21	Oct-21		Delayed by expired CAC cards

NOAA ACSPO L3S-LEO-PM (day)

BoM/IMOS L3S (day)

VIIRS Polar Winds

Accomplishments / Events:

- **First Two-Orbit Tandem Winds**: Until now, the S-NPP/NOAA-20 "tandem" winds have used three orbits, but the goal is to use two. The winds team has started evaluating winds derived from two. (See highlight)

Overall Status:

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

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

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/30/20	
Updated Cal/Val plan (DPMS comments)			04/23/21	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Jan-21	Mar-21	04/01/21	downstream testing
Initial J2 ready DAP to CSPP			05/26/21	
Final J2 ready DAP to ASSISTT	Mar-21	Mar-21	Mar-21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21		
Prototype the derivation of winds with the DNB using the heritage windco algorithm	Sep-21	Sep-21		
Implementation of the shortwave IR (2.25 μm) band winds	Sep-21	Sep-21	Jun-21	
Adapt QC method designed for winds derived using optical flow from image pairs to VIIRS tandem winds	Sep-21	Sep-21		
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:

At Right: The first example of tandem winds based on two orbits rather than three. The example is for 23 June 2021 covering latitudes from the equator to 60N. Yellow AMVs are below 700 hPa; cyan are 400-700 hPa; and magenta are above 400 hPa.

NUCAPS Products

Accomplishments / Events
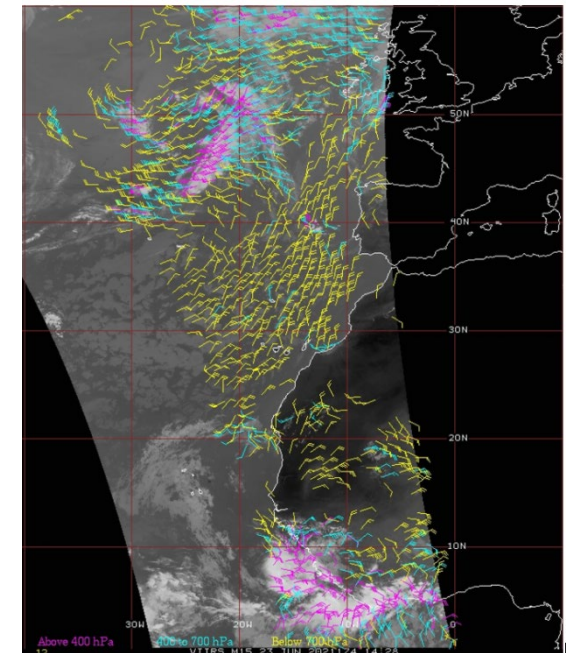
- NUCAPS v3.0 has been promoted to OSPO operations effective July 15. Performed an evaluation of the OSPO operational product with the with the NUCAPS offline version as a sanity check, and the results of evaluation revealed a perfect match.
- Provided NUCAPS team feedback to the S-NPP CrIS Side 1 SDR Beta/Provisional Maturity. Evaluation of the NUCAPS S-NPP LW/SW retrievals indicate noticeable degradation to the temperature and water vapor retrievals. The J2 ready enterprise DAP delivery moved to August to include S-NPP LW/SW version.
- Continued work on the validation of NUCAPS and CLIMCAPS ozone retrievals over the South Pole and Boulder, Colorado with the O3SND measurements.
- Continued work on the investigations into the V3.0 Boundary Layer warm bias and optimization of the temperature damping factor and tightening of QA associated with the final retrieval to remove some of the outliers that cause the larger boundary layer temperature biases.
- Team members worked on the BAMS manuscript "Utility of Satellite Retrievals of Atmospheric Profiles in Detecting and Monitoring Severe Weather Events at NOAA" *(Kalluri et al.)*. The manuscript has been resubmitted.

Overall Status:

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

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

Issues/Risks:

None

Milestones

| Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Validated Maturity: CO2 (S-NPP & NOAA-20)	Dec-20	Dec-20	12/17/20	
J2 Cal/Val Plan - final delivery	Dec-20	Dec-20	12/30/20	
Updated Cal/Val plan (address DPMS review comments)			04/28/21	
NUCAPS3.0/HEAP2.3 to ASSISTT			12/14/20	
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Apr-21	Apr-21	02/26/21 04/13/21 patch	
Initial J2 ready DAP to CSPP			04/27/21	
Final J2 ready DAP to ASSISTT	May-21	Aug-21		
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:
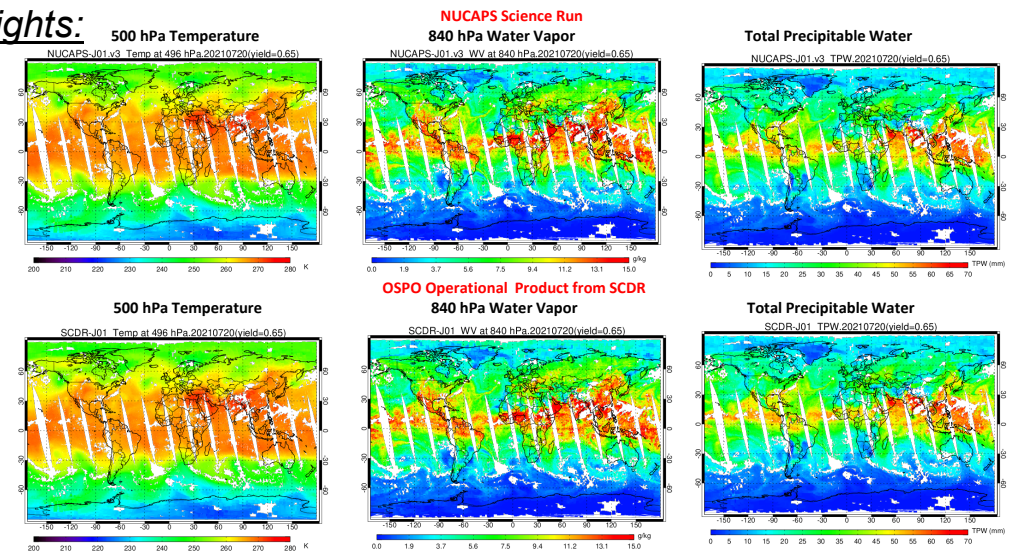
Figure 1.. NUCAPS v3.0 has been promoted to operations effective July 15. This figure shows an evaluation of July 20 OSPO operational product with the NUCAPS offline version as a sanity check. Results of evaluation revealed a perfect match.

MiRS Products

Accomplishments / Events:

- Work is progressing on testing a machine learning approach to improve the MiRS sea surface temperature (SST) retrieval from NOAA-20 ATMS data. A DNN was trained using 12 days of collocated ATMS and ECMWF data (one day per month) from 2020. This estimated error from the DNN is then used to correct the SST to obtain a final value. As comparison experiments, additional retrievals were run using both a DNN and a multilinear regression model trained with original observed brightness temperatures as inputs. The MiRS DNN-corrected SSTs show the best agreement with the ECMWF analysis, with a reduction in RMSE from 3.2 K (operational) to 1.8 K (DNN corrected). The other experiments that used TBs as input showed worse agreement relative to ECMWF, with RMSEs of 3.7 K (DNN) and 2.8 K (regression). A manuscript is being prepared for publication. See highlights.
- MiRS J2 DAP being prepared for delivery by 30 July.

Overall Status:

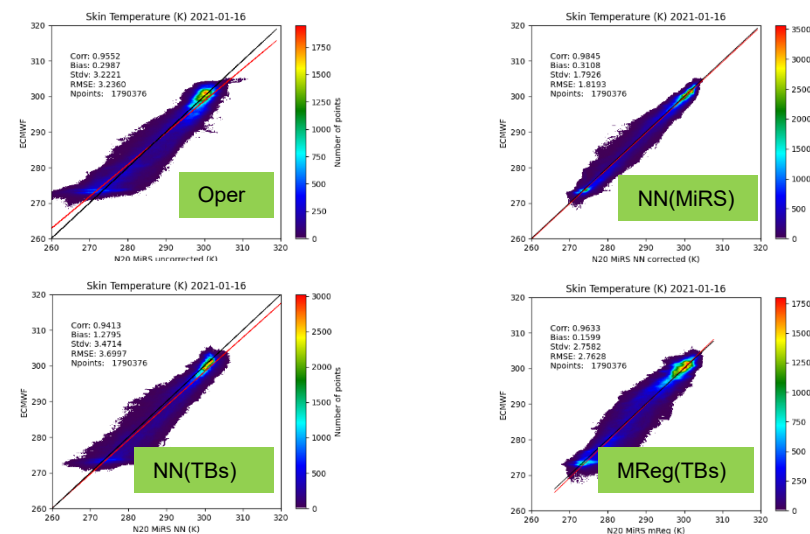|	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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
Initial J2 ready DAP to CSPP			06/11/21	
Final J2 ready DAP to ASSISTT	Jul-21	Jul-21	7/30/21	
Final J2 ready DAP to NDE (include NPP/N20 updates)	Dec-21	Jan-22		
Integrate SFR updates	Jun-21	Jul-21	Jul-21	Received SFR code package
AI based radiometric bias correction	Aug-21	Aug-21		
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:

Comparison of retrieved vs. ECMWF SST for four experiments: MiRS operational (top left), MiRS DNN corrected (top right), DNN using observed TBs (bottom left), and multilinear regression using observed TBs. Case is from 2021-01-16.

Snowfall Rate

Accomplishments / Events:

Assisting as needed with SFR update package that was delivered to the MiRS team. The major updates are:

- final JPSS-2 ready SFR algorithms
- radiometric bias correction for all satellites (JPSS, POES, and Metop)
- cloud temperature initialization for all satellites
- Machine Learning-enhanced algorithms including
  - NOAA-20 and S-NPP Snowfall Detection algorithms over CONUS
  - SFR bias correction for all satellites
  - Ice Water Path initialization for all satellites

The updated algorithms not only can capture snowfall over CONUS in cold conditions under which the current operational version does not apply, they also show improved performance with rate estimation.

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
Initial J2 ready DAP to CSPP			06/11/21	
Final J2 ready DAP to ASSISTT	Jul-21	Jul-21	07/30/21	MiRS delivery
Final J2 ready DAP to NDE (include NPP/N20 updates)	Dec-21	Jan-22		ASSISTT delivery
Updated SFR algorithms for JPSS-2	Jun-21	Jun-21	Jun-21	
Deliver updated SFR package (for JPSS-2, NOAA-20, and S-NPP) to MiRS team for integration	Jun-21	Jun-21	06/21/21	11/20/20 SFR package to MiRS
Explore AI-based snowfall detection	Sep-21	Sep-21		
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: NESDIS Snowfall Rate imagery available from NASA/SPoRT for Alaska Region
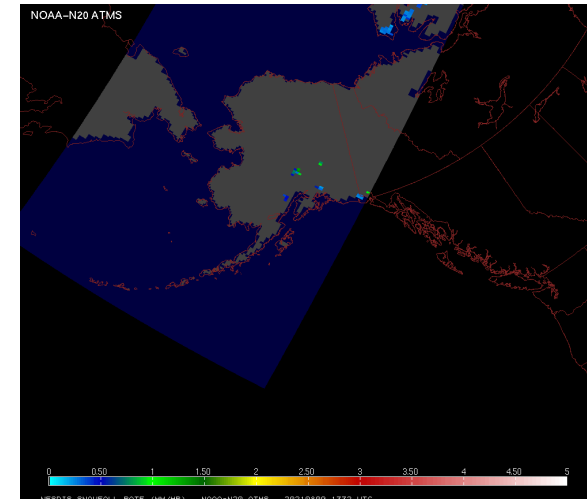
SPoRT is a NASA project to transition unique observations and research capabilities to the operational weather community to improve short-term forecasts on a regional scale.

OMPS Ozone

Accomplishments / Events:

- Evaluating 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.

- Assisting with evaluation of planned algorithm updates supporting OMPS NP EDR validation

- Continuing to review need for S-NPP OMPS-LP after J2 launch. Continue to recommend at a minimum that NOAA should keep producing S-NPP OMPS-LP products at NDE until J2 products are available and validated. The estimate for this is 1-1.5 years after J2 launch. NOAA-20 does not have the OMPS-LP instrument. See Highlight fro example of OMPS-LP NDE Product.

Overall Status:

|	Green[1] (Completed)	Blue[2] (On-Schedule)	Yellow[3] (Caution)	Red[4] (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X	☐		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.
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
JPSS-2 Schedule				
J2 Cal/Val Plan - draft delivery	Jun-20	Jun-20	05/21/20	
J2 Cal/Val Plan – V2.0 delivery	Dec-20	Dec-20	12/30/20	
Updated Cal/Val plan (address DPMS review comments)			04/23/21	
Initial J2 ready DAP to ASSISTT	Jul-20	Jul-20	v4r0: 07/07/20	V8Pro
Initial J2 ready DAP to ASSISTT	Nov-20	Nov-20	v4r2: 11/25/20	V8TOz
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Dec-20	Dec-20	12/31/20 04/15/21 patch 08/04/21 Patch	V8Pro
Initial J2 ready DAP to NDE (include NPP/N20 updates)	Apr-21	May-21	05/27/21	V8TOz: v4r2 V8TOS: v5r0
Final J2 ready DAP to ASSISTT	Jul-21	Jul-21		V8Pro
Final J2 ready DAP to ASSISTT	Jun-21	Jun-21	Jun-21	V8TOz
Final J2 ready DAP to NDE (include NPP/N20 updates)	Dec-21	Dec-21		V8Pro
Final J2 ready DAP to NDE (include NPP/N20 updates)	Nov-21	Nov-21		V8TOz
Algorithm Updates Review	Sep-20	Sep-20	08/18/20	
Algorithm Updates/Cal-Val Activities				
Details in next slides				

Highlights: OMPS-LP Aerosol see Pyrocumulus
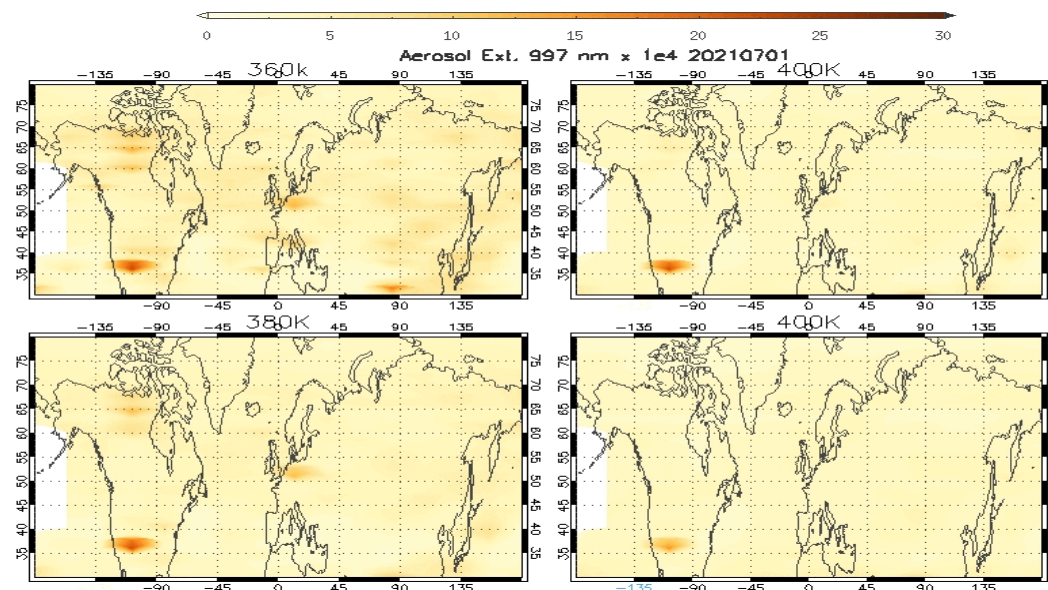
OMPS Ozone (V8Pro, V2Limb & V8TOz) Milestones

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.	Sep-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	

OMPS LP Detects Pyrocumulus from Fires
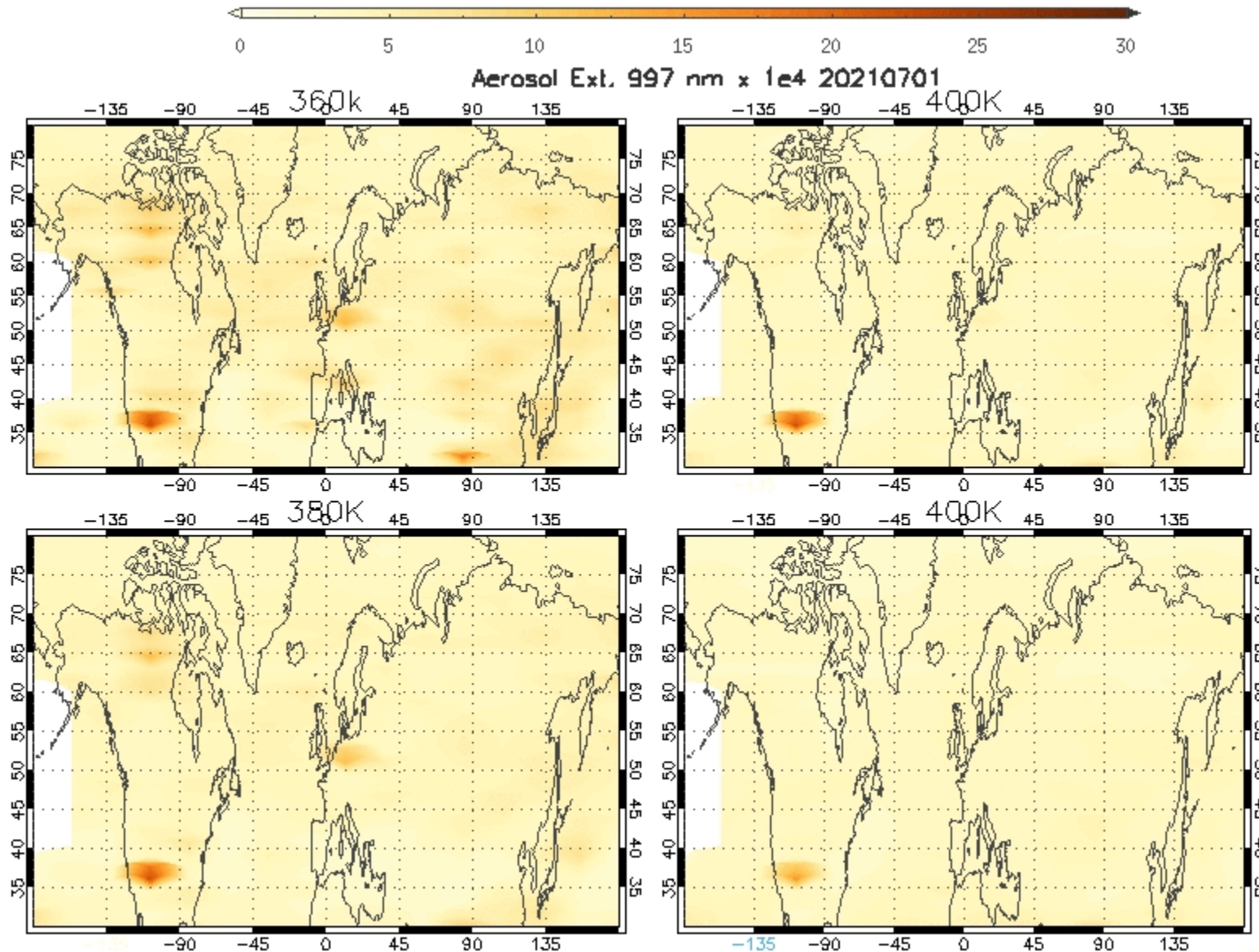
OMPS LP aerosol extinction daily maps at 997nm for four potential temperature levels (360-420K). The first pyroCb was detected in British Columbia, Ca, on July 1. For more information on the capabilities see this recent paper which came out a few days ago. The paper features, among others, OMPS LP measurements of the Australian fires in 2019/2020.
https://www.nature.com/articles/s41612-021-00192-9

July 20201 aninmation Courtesy Ghassan Taha, USRA Greenbelt MD.

Accomplishments / Events:

- Recovered and processed data lost because the STAR GCOM NRT development processing system suffered a system disk failure that required an operating system rebuild. This took the development GAASP system offline for a few weeks. STAR CAC renewal process failures hindered this effort.
- Algorithm updates to ASSISTT for planned GAASP updates in FY21
  - RR and SSW in progress
- Continued product O&M, keeping abreast of GOSAT-2 AMSR3 activities so plans can be developed for use at STAR.
- A new method has been developed to estimate sea ice thickness with AMSR2 data based on the snow-ice interface temperature and an ice thickness model.
- Ralph Ferraro retired 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			

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
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: Hurricane/Tropical Storm Elsa

AMSR2 rain rate retrievals depicting the impact of Hurricane/Tropical Storm Elsa as she approached and passed over Florida
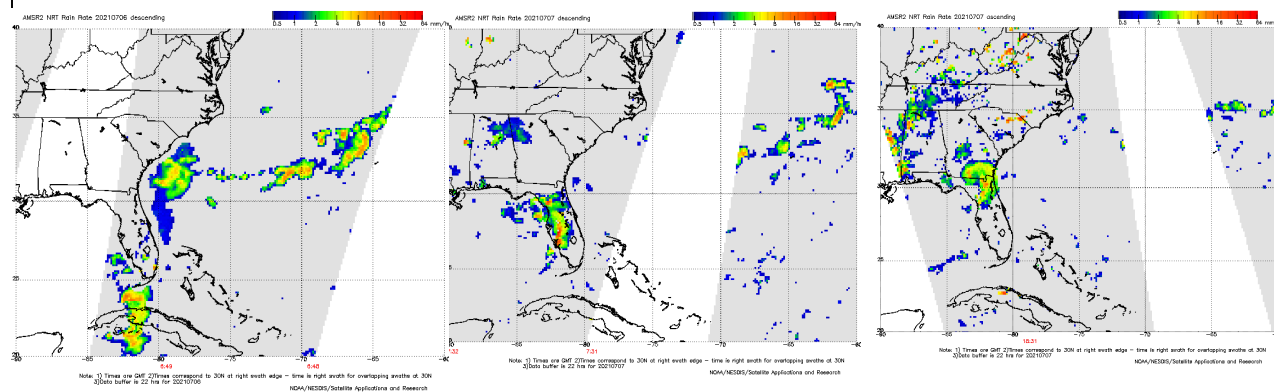
Accomplishments / Events:

- Provided presentations to JPSS NUCAPS Initiative Working Group on the February Ice Storm (upper Midwest) and the June record breaking heat wave (upper northwest, Portland) events during 2021.

- A. Reale is serving as NOAA Experimental and Research and Training Opportunity (NERTO) mentor for Ms. Cassandra Calderella, a NOAA Center for Earth Science and Remote Sensing Technologies (CESSRST) graduate student at UMBC; preliminary results from her 12-week (May 28-August 28) Summer Student Internship Opportunity (SSIO) are very interesting (**Highlight**)

Overall Status:

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

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Issues/Risks:

None

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

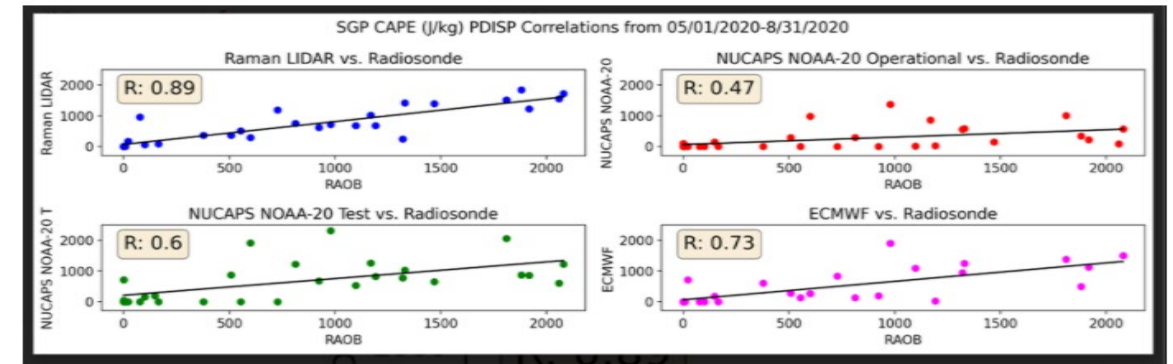## Highlights: *Preliminary Results, SSIO/NERTO Summer Intern*

Figure 1: "Preliminary" scatter plots of Convective Available Potential Energy (CAPE) calculations based on collocated Radiosonde for NUCAPS, ECMWF and Lidar observations from the ARM / GRUAN site at Lamont (OK) during Summer, 2020; all collocations are within 2-hours. The NUCAPS include current operation v2.5 (Red) and the candidate v3 (Green) upgrade. Preliminary results indicate improved agreement with the radiosonde for v3 (r = 0.60) compared to v2.5 (r = 0.47) with lidar showing the highest correlation (r = 0.89) followed by ECMWF (r = 0.73). Work continues