



NOAA JPSS Monthly Program Office

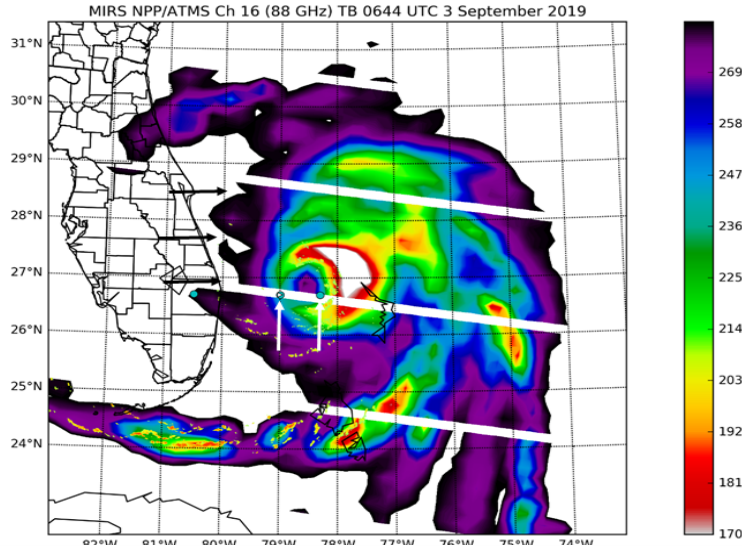
AMP/STAR FY19 TTA

Lihang Zhou, AMP & PSDI Lead
Bonnie Reed, AMP Deputy
Banghua Yan & Satya Kalluri, Acting AMP Deputies for Science
& JPSS STAR Program Managers

October 8, 2019

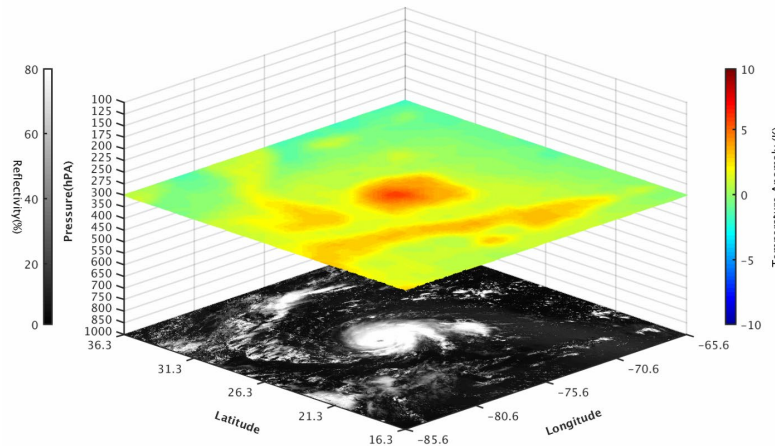
Highlights from the Science Teams

JPSS Captures Hurricane Dorian



The ATMS Channel 16 Brightness Temperature shows the powerful core of the storm.

DORIAN 2019-09-01



The ATMS Channels 5-12 are used to capture the temperature differences between the outer and the inner portions of the hurricane, known as the upper-level warm core structure. The ATMS data has been limb corrected and gap-filled. The VIIRS cloud top reflectivity at band I1 (0.64 μ m) is shown as background.

Highlights from the Science Teams

S-NPP SDR Reprocessed Data Validated Maturity Review

A validated maturity review meeting for the SNPP reprocessed SDR was held on September 17, 2019. This review meeting was a major milestone for releasing the reprocessed SNPP SDR data in a variety of applications to support NOAA's weather and climate mission goals. The SNPP reprocessing project was initiated at STAR in 2015. Its goal was to reprocess all the SNPP instruments through their life-cycle using the most recently updated and unified calibration algorithms to generate consistent SDRs.

With several year's effort, 5 years of the SNPP SDR data during the period from its launch time until March 7, 2017 for the SNPP instruments have been reprocessed using their baseline calibration algorithms. The reprocessing allows scientists to quantify the SDR quality in the time dimension, offering the opportunity for the SDRs to be used in a variety of environmental applications such as development of climate data records, identifying NWP model errors, improving climate reanalyses as input datasets, and supporting satellite CAL/VAL and GSICS programs as references.

03/20/2012 (Improvement after Reprocessing)

IDPS SDR
(poor calibration)

Reprocessed SDR
(improved
calibration)

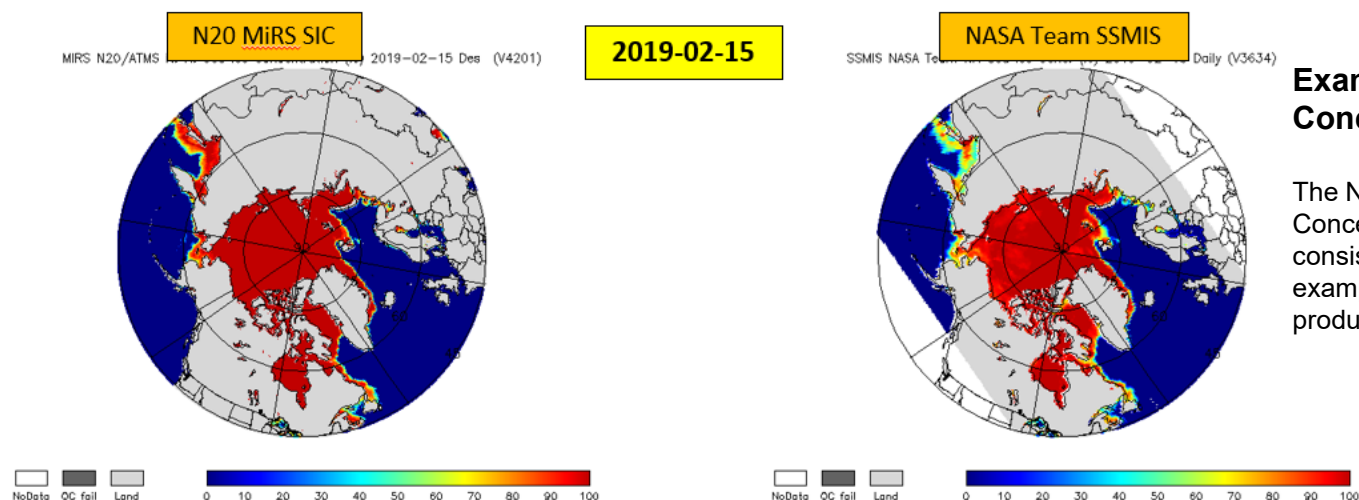
Example of improvement for the SNPP SDR Day-Night-Band.
In the original IDPS SDR the night-time lights and bright locations are not well defined due to poor calibration. Reprocessing provides a wealth of additional information.

NOAA-20 MiRS Product Maturity Review

On September 19, the MiRS suite of NOAA-20 microwave-derived products was reviewed for Validated Maturity.

The products included in this suite include moisture profile, temperature profile, rainfall rate, total precipitable water, land surface emissivity, land surface temperature, cloud liquid water, sea ice concentration, snow cover/depth, and snow-water equivalent.

Feedback from review team is expected shortly.

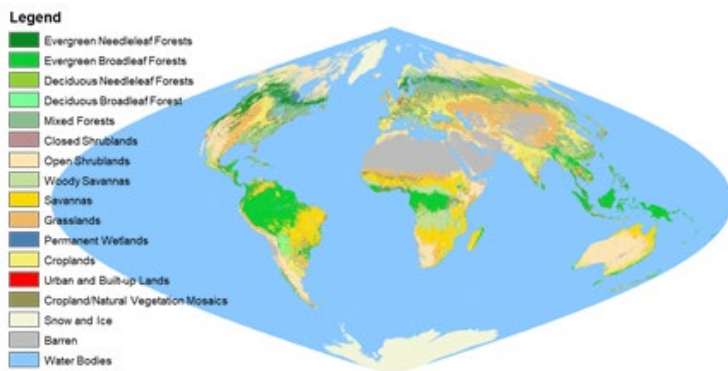


Example of Sea Ice Concentration in the Arctic.

The NOAA-20 MiRS Sea Ice Concentration (SIC) on the left is consistent with similar products, for example the NASA Team SSMIS products from DMSP F18 on the right

NOAA-20 VIIRS Surface Type Product Maturity Review

On September 19, the VIIRS global gridded surface type product was reviewed for Beta Maturity status. Reviewer feedback is expected shortly. Accurate surface type is required for numerical weather prediction models, particularly related to the surface energy budget and hydrologic cycle.



Surface Type

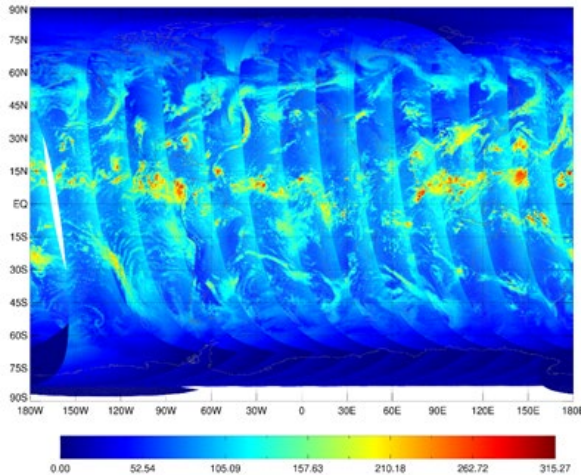
Annual Surface Type from VIIRS using the Equal Area map projection

Highlights from the Science Teams

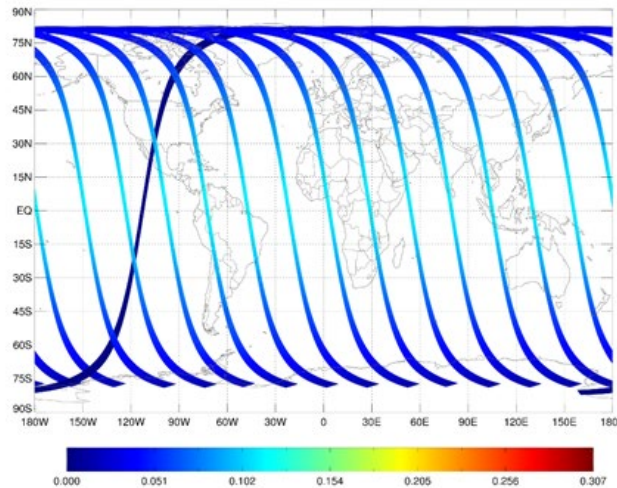
NOAA-20 OMPS SDR Product Maturity Review

On September 20, the NOAA-20 OMPS SDR products to support monitoring of Ozone were reviewed for Validated status. The Review Panel will release their findings shortly.

NOAA-20 OMPS TC Radiance $\text{mW m}^{-2} \text{nm}^{-1} \text{sr}^{-1}$ 2019/09/15 at 331.4nm



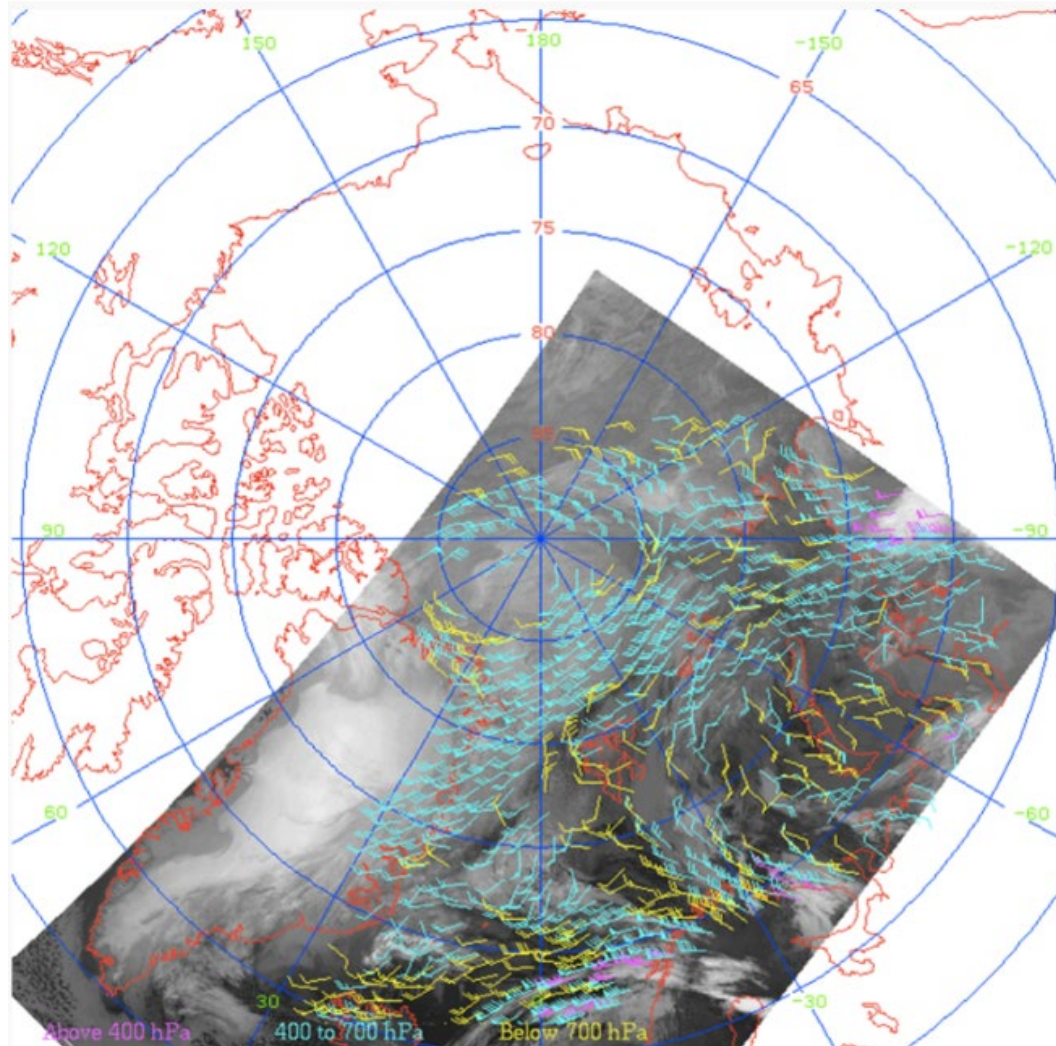
NOAA-20 OMPS NP Radiance $\text{mW m}^{-2} \text{nm}^{-1} \text{sr}^{-1}$ 2019/09/15 at 282.8nm



Example of OMPS Total Column Radiance and OMPS Nadir Profile Radiance.

The OMPS Nadir Mapper SDR used for Total Column Radiance at left has a 2800 km swath. The OMPS Nadir Profile SDR has a 250 km swath but a larger spectral range.

Highlights from the Science Teams



NOAA-20 Operational Winds Product Meet Requirements over Summer Season. Starting 1 June through 31 August 2019, all available NOAA-20 Cloud Motion Vectors (CMV) being generated by operations (v2r1) were compared to radiosonde wind data from the International Global Radiosonde Archive provided by NOAA. Comparisons are made for all vectors that within 100 km and 1 hour of the radiosonde launch site, Results show accuracies within 6 ms^{-1} over the Arctic and 7 ms^{-1} over the Antarctic. These results confirm and extend the validation findings of the Maturity Review.

Image on left is an example of the VIIRS Polar Winds product showing high, medium and low clouds in purple, cyan and yellow respectively.

Highlights from the Science Teams

JPSS LST and LSA ARR conducted

The Land Surface Temperature (LST) and Land Surface Albedo (LSA) teams, working with the ASSIST team, conducted and passed the Algorithm Readiness Review for the development of Global Gridded LST and LSA which are composited and aggregated from their level 2 granule products. The algorithm developed for the gridded LST and LSA products is expected to be operational in NDE no later than November for NOAA-19 and NOAA-20.

Advanced Training School on Remote Sensing and Earth Observation

On September 15-20 2019, Ivan Csiszar attended the Advanced Training School on Remote Sensing and Earth Observation held in Võru, Estonia. Csiszar was an invited by Tartu University to give a lecture NS hands-on training on satellite-based fire monitoring. In addition to the basics of fire detection and characterization, Csiszar gave an update on the status of fire products from NOAA's new generation polar and geostationary missions. He also presented case studies to demonstrate capabilities of the JPSS satellites to monitor fires in Northern Europe. In particular, he demonstrated early detection capabilities of VIIRS, which provides more frequent coverage at high latitudes.

Accomplishments

- CrIS SDR team received JPSS award for recovering S-NPP CrIS SDR (SNPP/CrIS Side-2 Calibration/Validation) PICTURE
- 9/8-16/2019 successful NOAA dedicated Ocean Color cruise for in-situ data collection PICTURE
- Delivery Algorithm Packages (DAPs) - Mission Unique Products:
 - 9/3/2019 OMPS SDR DAP (ADR9093/CCR4638 NOAA-20 OMPS TC & NP LUT Updates for Validated Maturity) to DEPS. Tables updated were OMPS-NP-STRAYLIGHT_LUT_j01, OMPS-TC-STRAYLIGHT_LUT_j01, OMPS-TC-OSOL-LUT_j01, and OMPS-TC-WAVELENGTH-GND-PI_j01
 - 9/5/2019 VIIRS Terrain-Corrected EDR Imagery Algorithm Readiness Review (ARR)
 - 9/30/2019 VIIRS Terrain-Corrected EDR Imagery DAP delivered to DPES (ADR8239&ADR8656/CCR4646):
 - ADR 8239: Terrain-Correction geo-locations needed for VIIRS EDR Imagery
 - ADR 8656: VIIRS GEO SW not making internal GRC files needed for Terrain-Corrected Imagery EDRs
- DAPs - Enterprise Products:
 - 8/30/2019 OMPS Ozone team delivered V8TOS (LFSO2) update DAP to ASSISTT
 - 9/4/2019 OMPS Ozone team delivered DAP V8PRO_v3r3 to ASSISTT
 - 9/24/2019 VIIRS Global Gridding Land Surface Temperature and Albedo Algorithm Readiness Review (ARR)
 - 9/27/2019 VIIRS Surface Type team delivered Global Annual Surface Type (AST-2018) package to JSTAR. AST-2018 is now ready for users to download from STAR FTP site (<https://www.star.nesdis.noaa.gov/jpss/>)
- IDPS Builds Checkouts:
 - STAR submitted Block 2.1 Mx8 SOL deploy regression review/checkout report on 9/13/2019

Accomplishments – JPSS Cal Val Supports

- NOAA-20/S-NPP Operational Calibration Support:
 - S-NPP Weekly OMPS TC/NP Dark Table Updates: 09/03/19, 09/10/19, 09/17/19, 09/24/19
 - NOAA-20 Weekly OMPS TC/NP Dark Table Updates: 09/03/19, 09/10/19, 09/17/19, 09/24/19
 - S-NPP Bi-Weekly OMPS NP Wavelength & Solar Flux Update: 09/10/19, 09/24/19
 - NOAA-20 Bi-Weekly OMPS NP Wavelength & Solar Flux Update: 09/03/19, 09/17/19
 - S-NPP Monthly VIIRS StrayLight LUTs Update: 09/10/19
 - NOAA-20 Monthly VIIRS StrayLight LUTs Update: 09/10/19
 - S-NPP Monthly VIIRS LUT Update of DNB Offsets and Gains: 09/10/19
 - NOAA-20 Monthly VIIRS LUT Update of DNB Offsets and Gains: 09/10/19

- NDE build 2.0.19 operational on 9/17/2019
 - NOAA-20 Land Surface Temperature (LST)
 - NOAA-20 Surface Albedo (LSA)

- 9/17/2019: Reprocessed S-NPP SDRs (ATMS, CrIS, VIIRS, and OMPS) validated maturity review
- 9/19/2019: NOAA-20 Cal/Val Maturity Review
 - MiRS products (Moisture Profile, Temperature Profile, Rainfall Rate, Total Precipitable Water, Land Surface Emissivity, Land Surface Temperature, Cloud Liquid Water, Sea Ice Concentration, Snow Cover/Depth, Snow-Water Equivalent) validated maturity review
 - Annual Surface Type (AST) beta maturity review
- 9/20/2019: NOAA-20 Cal/Val Maturity Review
 - OMPS SDR (TC & NP) validated maturity review
 - OMPS EDRs: V8Pro beta maturity review; V8TOz validated maturity review

Upcoming Cal/Val Maturity Reviews

October Maturity Review (10/24/2019):

- Provisional Maturity:
NUCAPS CH4 product (S-NPP & NOAA-20)
- Validated Maturity:
NOAA-20 NUCAPS products: AVTP, AVMP, Ozone, OLR
NUCAPS CO product (S-NPP & NOAA-20)

November Maturity Review:

- Validated Maturity:
Land Surface Temperature
Surface Albedo
Surface Reflectance

December Maturity Review:

- Validated Maturity:
Active Fires (M-Band)
OMPS Ozone (V8Pro)

- JSTAR Code/LUT/Product Deliveries:

DAP to DPES:

NOAA-20 Algorithm DAP to NDE/CoastWatch:

- Oct-19: V8TOz – code & LUT update
- Oct-19: NUCAPS – Final DAP
- Oct-19: I-band Active Fires – Initial DAP
- Dec-19: I-band Active Fires – Final DAP
- Mar-20: Vegetation Health – Final DAP
- Nov-20: Ocean Color – Final DAP



FY19 STAR JPSS TTA Milestones

FY19 TTA Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Algorithm Updates DAPs/LTM				
ATMS TDR/SDR: Reflector emissivity correction (code & PCT update)	Sep-19	Sep-19	02/11/19	
CrIS SDR: Polarization correction algorithm implementation	Sep-19	Sep-19	05/07/19	
VIIRS SDR: J2 Pre-launch sensor characterization report	Oct-18	Oct-18	10/01/18	
VIIRS SDR: GEO parameter side dependence	Mar-19	Mar-19	12/11/18	
OMPS SDR: J2 Pre-launch sensor characterization report	Jun-19	Oct-19		PSR: Jun-19 New lead
NOAA-20 EDR Final DAPs (JRR, SST)	Jun-19	Jun-19	02/12/19: ACSPO 2.61 03/11/19: JRR, LST/LSA, & VPW	
NOAA-20 EDR Final DAPs (MIRS, NUCAPS)	Sep-19	Sep-19	03/29/19: MiRS v11.4 NUCAPS: Oct-19	NUCAPS new lead
AST18 (Annual Surface Type)	Sep-19	Sep-19	09/27/19	
Updated GCOM/AMSR-2 GAASP package deliver to NDE	Jul-19	Jul-19	Jul-19	



FY19 STAR JPSS TTA Milestones

FY19 TTA Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
NOAA-20 Cal/Val				
Validated Maturity: NOAA-20 CrIS SDR	Oct-18	Oct-18	10/02/18 (Review Date) 08/14/18 (Effective Date)	
Validated Maturity: NOAA-20 OMPS SDR	Dec-18	Sep-19	09/20/19	PSR: Jun-19
Provisional Maturity: NOAA-20 EDR Products (JRR/VPW/Trace Gas)	Oct-18	Oct-18	10/02/18: Provisional Maturity: Cloud Mask, Cloud Phase/Type, Cloud Height (CTT/CTP/CTH), Cloud Base Height, Polar Winds, NUCAPS (Ozone/CO/OLR), OMPS Ozone (V8TOz) 11/27/18: Provisional Maturity: Volcanic Ash, Daytime Cloud Optical and Microphysical Properties (DCOMP) 03/21/19: Provisional Maturity: Nighttime Cloud Optical and Microphysical Properties (NCOMP)	
Provisional Maturity: NOAA-20 EDR Products (LST/LSA/Vegetation)	Mar-19	Mar-19	03/21/19 Provisional Maturity: LST/LSA/VI/GVF/SR Validated Maturity: Vegetation Health	
Provisional Maturity: NOAA-20 EDR Products (OC)	Apr-19	Apr-19	11/27/18: Ocean Color Beta/Provisional Maturity	
Validated Maturity: NOAA-20 EDR Products (JRR/VPW)	Jun-19	Jun-19	05/16/19: Validated Maturity: Cloud products (ECM, Cloud Type/Phase, CTP/CTP/CTH/CBH, CCL, DCOMP, and NCOMP), Cryosphere products (IST, Ice Concentration, and Ice Age/Thickness), Polar Winds, Aerosol products (AOD & ADP), Volcanic Ash, and SFR Provisional Maturity: I-Band Fires, and Snow Cover	
Validated Maturity: NOAA-20 EDR Products (SST)	Jun-19	Jun-19	05/16/19	
Validated Maturity: NOAA-20 EDR Products (MIRS, NUCAPS)	Sep-19	Sep-19	MIRS 09/19/19 NUCAPS: Oct-19 (scheduled)	NUCAPS New lead



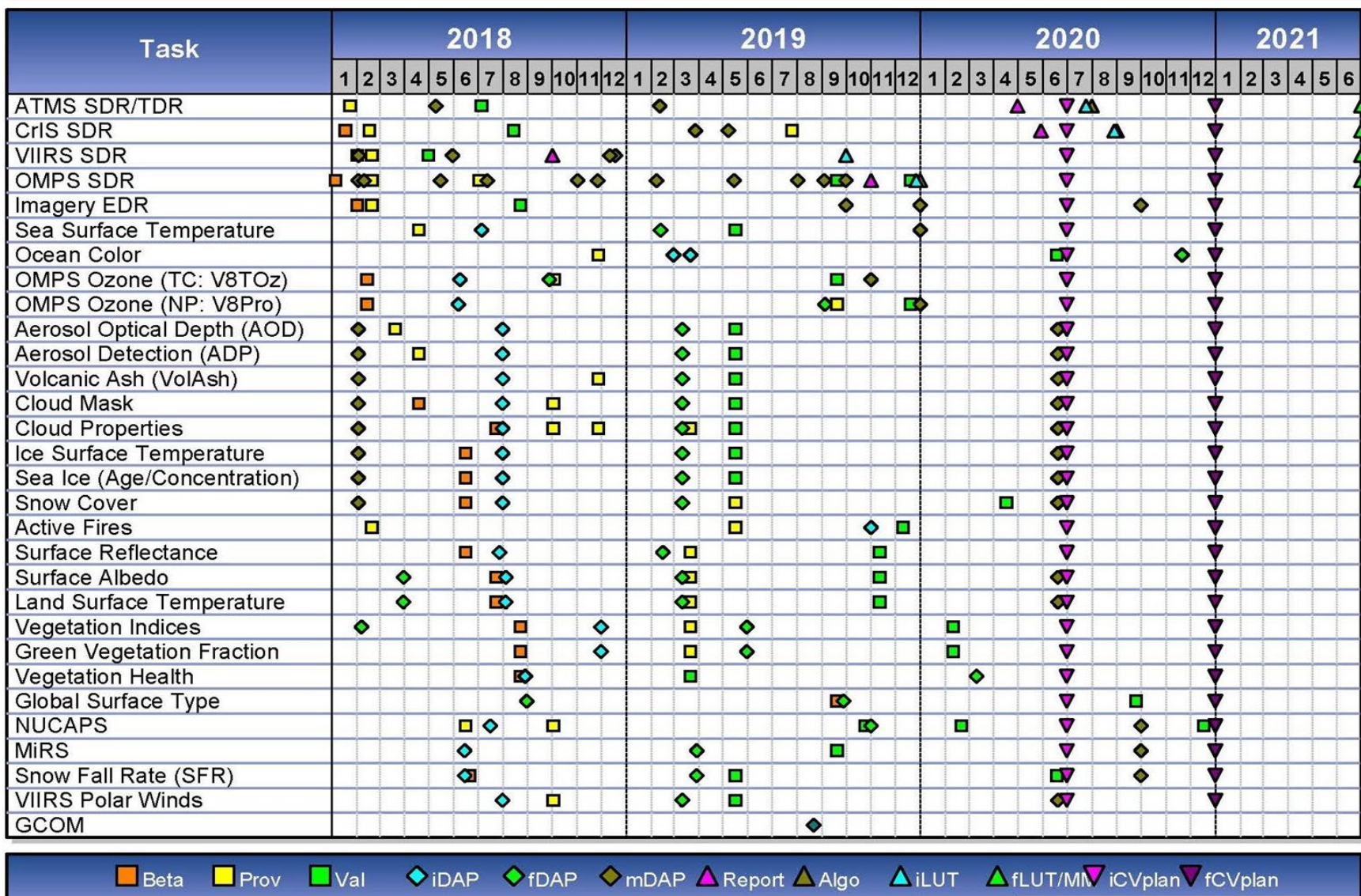
FY19 STAR JPSS TTA Milestones

FY19 TTA Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Operational Support				
S-NPP: Weekly OMPS TC/NP Dark Table Updates	Weekly	Weekly	10/02/18, 10/10/18, 10/16/18, 10/23/18, 10/30/18, 11/06/18, 11/14/18, 11/20/18, 11/27/18, 12/04/18, 12/11/18, 12/18/18, 01/02/19, 01/08/19, 01/15/19, 01/23/19, 01/29/19, 02/05/19, 02/12/19, 02/20/19, 02/26/19, 03/05/19, 03/12/19, 03/19/19, 03/26/19, 04/02/19, 04/09/19, 04/16/19, 04/23/19, 04/30/19, 05/07/19, 05/14/19, 05/21/19, 05/29/19, 06/04/19, 06/11/19, 06/18/19, 06/25/19, 07/02/19, 07/09/19, 07/16/19, 07/23/19, 07/30/19, 08/06/19, 08/13/19, 08/20/19, 08/27/19, 09/03/19, 09/10/19, 09/17/19, 09/24/19	
S-NPP: Bi-Weekly OMPS NP Wavelength & Solar Flux	Bi-Weekly	Bi-Weekly	10/10/18, 10/23/18, 11/06/18, 11/20/18, 12/04/18, 12/18/18, 01/02/19, 01/15/19, 01/29/19, 02/12/19, 02/26/19, 03/12/19, 03/26/19, 04/09/19, 04/23/19, 05/07/19, 05/21/19, 06/04/19, 06/18/19, 07/02/19, 07/16/19, 07/30/19, 08/13/19, 08/27/19, 09/10/19, 09/24/19	
S-NPP: Monthly VIIRS LUT update of DNB Offsets and Gains	Monthly	Monthly	10/16/18, 11/14/18, 12/13/18, 01/15/19, 02/12/19, 03/12/19, 04/10/19, 05/14/19, 06/11/19, 07/09/19, 08/07/19, 09/10/19	
S-NPP: Monthly VIIRS Stray Light LUT Update	Monthly	Monthly	05/14/19, 06/11/19, 07/09/19, 08/07/19, 09/10/19	5/14/19: started new set of S-NPP Stray Light LUT update
NOAA-20: Weekly OMPS TC/NP Dark Table Updates	Weekly	Weekly	10/02/18, 10/10/18, 10/16/18, 10/23/18, 10/30/18, 11/06/18, 11/14/18, 11/20/18, 11/27/18, 12/04/18, 12/11/18, 12/18/18, 01/02/19, 01/08/19, 01/15/19, 01/23/19, 01/29/19, 02/05/19, 02/12/19, 02/20/19, 02/26/19, 03/05/19, 03/12/19, 03/19/19, 03/26/19, 04/02/19, 04/09/19, 04/16/19, 04/23/19, 04/30/19, 05/07/19, 05/14/19, 05/21/19, 05/29/19, 06/04/19, 06/11/19, 06/18/19, 06/25/19, 07/02/19, 07/09/19, 07/16/19, 07/23/19, 07/30/19, 08/06/19, 08/13/19, 08/20/19, 08/27/19, 09/03/19, 09/10/19, 09/17/19, 09/24/19	
NOAA-20: Bi-Weekly OMPS NP Wavelength & Solar Flux	Bi-Weekly	Bi-Weekly	05/14/19, 05/29/19, 06/11/19, 06/25/19, 07/09/19, 07/23/19, 08/06/19, 08/20/19, 09/03/19, 09/17/19	5/14/19: started NOAA-20 bi-weekly delivery
NOAA-20: Monthly VIIRS LUT update of DNB Offsets and Gains	Monthly	Monthly	10/16/18, 11/14/18, 12/18/18, 01/15/19, 02/12/19, 03/12/19, 04/10/19, 05/14/19, 06/11/19, 07/09/19, 08/07/19, 09/10/19	
NOAA-20: Monthly VIIRS Stray Light	Monthly	Monthly	10/16/18, 11/14/18, 12/18/18, 01/15/19, 02/12/19, 03/13/19,	



STAR JPSS Schedule

STAR JPSS Schedule: TTA Milestones



Color code:

Green:

Completed Milestones

Gray:

Non-FY19 Milestones

Accomplishments / Events:

- Fixed the ATMS calibration algorithm bugs caused by different science RDR ingestion order over lunar intrusion affected regions.
- Performed IDPS Block 2.1 Mx 7 INT data verification due to the ATMS reflector emission and PCT updates.
- Updated ATMS vs AMUS-A/MHS SNO bias evaluation quality control steps to improve the ATMS data quality evaluation quality
- Prepared for the AMS Joint Satellite Conference presentations and posters for ATMS SDR team
- Evaluated NOAA-20 and S-NPP ATMS TDR/SDR bias using ATMS reprocessing data by latest calibration algorithms

Overall Status:

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

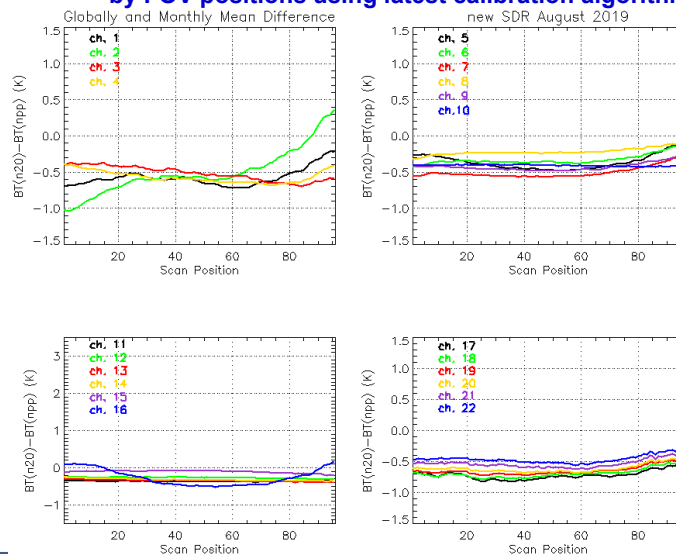
- Project has completed.
- Project is within budget, scope and on schedule.
- Project has deviated slightly from the plan but should recover.
- Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

None

Highlights:

S-NPP vs. NOAA-20 Monthly Mean Bias Double Difference by FOV positions using latest calibration algorithm



Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
NOAA-20 and SNPP cross verification	Sep-19	Sep-19		
Annual ATMS TDR/SDR performance report	Aug-19	Feb-20		SJASTM: Feb-20
J2 pre-launch test data (TVAC) review/analyze	Sep-19	Jan-20		TVAC: Oct-19 TVAC + 3m
Reflector emissivity correction DAP (PCT and code update, ADR8632/CCR3971)				
Technical Interchange Meeting (TIM)	Feb-19	Feb-19		
DAP to ASSISTT	Feb-19	Feb-19	01/31/19	
DAP to DPES	Mar-19	Mar-19	02/11/19	
IDPS Mx build I&T deploy regression support:				
Mx 5 data review/checkout	Feb-19	Feb-19	02/11/19	
Mx 6 data review/checkout	May-19	May-19	05/17/19	
Mx 7 data review/checkout	Sep-19	Sep-19	08/20/19	

Accomplishments / Events:

- The STAR CrIS SDR team led efforts to transition the SNPP CrIS SDR Reprocessing Data Products to the Validated Maturity Level, during the JPSS Science Review held on September 17, 2019. Results demonstrated better long-term radiometric, spectral and geolocation stability of the SNPP/CrIS SDR reprocessing data in comparison to operational data. The radiometric evaluation results showed that the CrIS SDR Reprocessing data holds better radiometric consistency between FOVs and between instrument sweep directions (forward and reverse) than CrIS SDR Operational data. The reprocessed CrIS SDR data has shown relative and absolute spectral errors of less than 0.5 ppm (Figure (1)), for a single FOV, and no greater than 2 ppm for all FOVs, over the three CrIS spectral bands. The geolocation uncertainty of the reprocessed data is consistently within 250 meters for all FORs, over nearly five years of reprocessing data.
- On September 11, 2019, an overview of the status of the ECT (Figure (2)). temperature calibration testing was given by Harris Corporation. A layout of the new ECT being used was provided along with the primary plate with its PRT distribution (Figure (3)). The PRT's are set up in the arrangement of the FOVs of the CrIS instrument, and are attached to the rear of the plate. One aim is to reach high temperature uniformity between PRTs, as the temperature across the ECT is incremented. During testing, it was found that there was a consistent measurement of temperature differences across the plate, indicating stability in the heating system and the measuring process.

Overall Status:

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

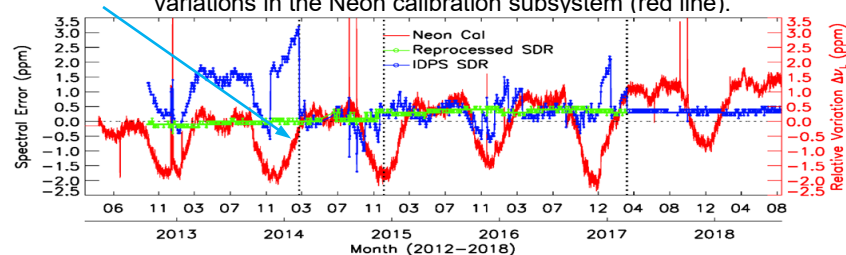
1. Project has completed.
2. Project is within budget, scope and on schedule.
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Issues/Risks:

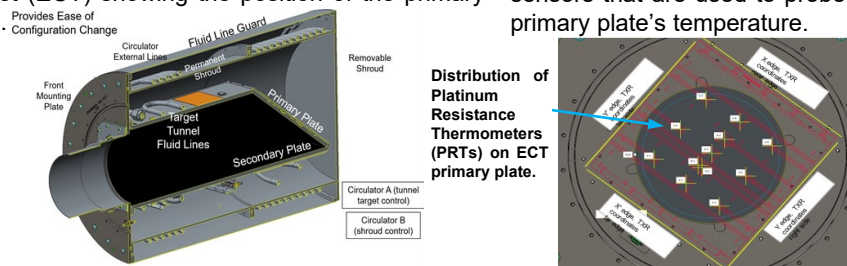
Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
NOAA-20 and SNPP cross verification	Sep-19	Sep-19		
Annual CrIS SDR performance report	Aug-19	Feb-20		SJASTM: Feb-20
J2 pre-launch test data (TVAC) review/analyze	Sep-19	Apr-20		TVAC: Jan-20 TVAC + 3m
S-NPP Beta/Provisional review (side-2)			07/25/19	
Polarization correction algorithm implementation DAP (ADR8760)				
Technical Interchange Meeting (TIM)	Feb-19	Feb-19	12/19/18 06/07/19	TIM 1 TIM 2
DAP to ASSISTT	Jul-19	Jul-19	04/22/19	
DAP to DPES	Aug-19	Aug-19	05/07/19	
Turn off Spike detection and Correction Algorithm due to false alarms (ADR8819/CCR4201)			12/18/18	
Refining the threshold values for CrIS lunar intrusion detection (ADR8903/CCR4451)			03/27/19	
Turn off Truncated Spectrum CrIS Data	Sep-19	Apr-20		OSPO/User
IDPS Mx build I&T deploy regression support:				
Mx 5 data review/checkout	Feb-19	Feb-19	02/13/19	
Mx 6 data review/checkout	May-19	May-19	05/17/19	
Mx 7 data review/checkout	Jul-19	Aug-23	08/20/19	

Highlights: (1) The long-term spectral uncertainty associated with the FOV5

of the CrIS LWIR band, derived from the CrIS SDR reprocessing



(2) Cutout CAD drawing of External Calibration Target (ECT) showing the position of the primary plate. (3) Layout of PRT temperature sensors that are used to probe the primary plate's temperature.



Accomplishments / Events:

- Delivered for deployment in IDPS operations updated NOAA-20 and S-NPP DNB offset and gain ratio LUTs generated using new moon calibration data from Aug. 30, 2019
- Delivered for deployment in IDPS operations updated NOAA-20 and S-NPP DNB stray light correction LUTs generated from the late August 2019 data
- Collected DNB new moon calibration data on Sep. 28, 2019 for both NOAA-20 and S-NPP VIIRS and began their analysis to derive updated monthly offset and gain ratio LUTs
- Presented on S-NPP VIIRS reprocessed SDR data validated maturity during Science Review held at NCWCP on 9/17/19. Reprocessed NPP VIIRS SDR has achieved Validated Maturity
- Created initial versions of the JPSS-2 VIIRS SDR LUTs: VIIRS-SDR-REFLECTIVE-LUT, VIIRS-SDR-CAL-AUTOMATE-LUT, VIIRS-SDR-DG-ANOMALY-DN-LIMITS-LUT, VIIRS-RSBAUTOCAL-ROT-MATRIX-LUT, VIIRS-RSBAUTOCAL-SDSM-TIME-LUT
- Generated simulated RDR files from the SI-2 test data and processed them to produce Onboard Calibrator Intermediate Product (OBC IP) files that include data on calibrator view dark offsets intended for the DNB radiometric calibration
- Two oral presentations on VIIRS at EROS CalVal Center of Excellence (ECCOE) workshop held at USGS, Reston, VA on 09/23/2019 with focus on Geo-Leo calibration/validation

Overall Status:

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

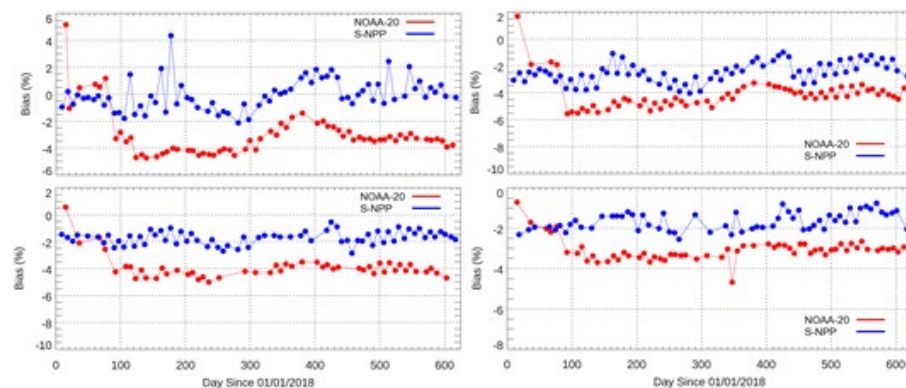
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2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

none

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
NOAA-20 and SNPP cross verification	Sep-19	Sep-19	Sep-19	
Annual VIIRS SDR performance report	Aug-19	Feb-20		SIJASTM: Feb-20
J2 pre-launch test data (TVAC) review/analyze	Sep-19	Sep-19	Sep-19	
J2 Pre-launch sensor characterization report			10/01/18	
J2 Launch-ready LUTs (initial delivery)	Sep-19	Dec-19		Mx7/8 TTO
Comprehensive solution for VIIRS Geo SCE SideB HAM mirror LUT Missing (code and LUTs, ADR8788/CCR4185)	Dec-18	Dec-18	12/11/18	
Remove COEFF-A and COEFF-B LUTs (ADR8785/CCR4148)	Mar-19	Mar-19	12/18/18	
IDPS Mx build I&T deploy regression support:				
Mx 5 data review/checkout	Feb-19	Feb-19	02/07/19	
Mx 6 data review/checkout	May-19	May-19	05/16/19	
Mx 7 data review/checkout	Sep-19	Sep-19	08/20/19	

Highlights:



NOAA-20 and S-NPP VIIRS radiometric consistency for bands M1-M4: near constant bias continue to exist for all VIIRS reflective solar bands

Accomplishments / Events:

- Regular weekly dark deliveries for OMPS sensors were made.
- Regular bi-weekly SNPP OMPS-NP wavelength and solar flux for OMPS sensors were made.
- Regular bi-weekly N20 OMPS-NP wavelength and solar flux for OMPS sensors were made.
- Summarized recent SDR work and presented OMPS SDR maturity report to the project review panel.
- N20 OMPS NM SDR reaches to the validated maturity level.

Overall Status:

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

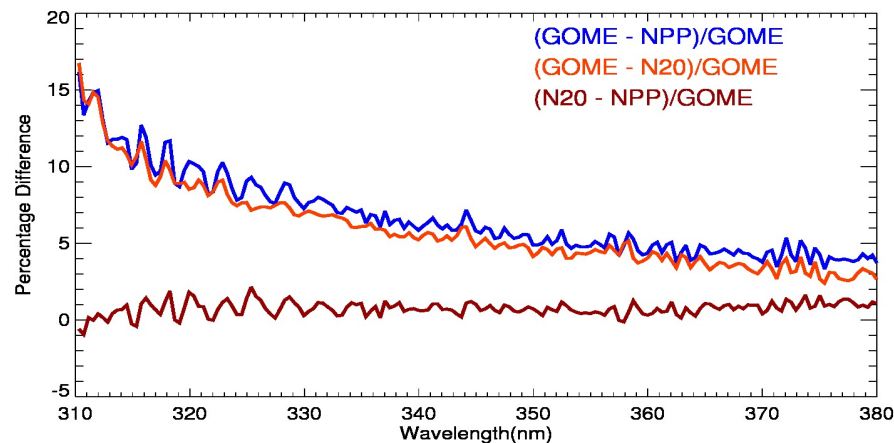
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Issues/Risks:

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Validated Maturity	Jun-19	Sep-19	09/20/19	
NOAA-20 and SNPP cross verification	Sep-19	Sep-19	09/20/19	
Annual OMPS SDR performance report	Aug-19	Feb-20		SJASTM: Feb-20
J2 pre-launch test data review/analyze	Sep-19	Oct-19		
J2 Pre-launch sensor characterization report	Jun-19	Oct-19		PSR changed
OMPS NM/NP Mismatch for FOVs (ADR8617/CCR4137)			11/01/18	
Update NOAA-20 OMPS Calibration Tables (ADR8816)	Dec-18	Dec-18	02/07/19	Govt. shutdown
OMPS NP Transient Smear Correction (ADR8709/CCR4138)	Dec-18	Dec-18	11/26/18	
Start N20 bi-weekly FT LUT update			05/14/19	
DAP (ADR8550, remove snow/ice & QST tile dependency)			08/01/19	To ASSISTT
DAP (ADR9093, NOAA-20 OMPS TC & NP LUT updates for Validated Maturity)			08/19/19 09/03/19	To ASSISTT To DPES
IDPS Mx build I&T deploy regression support:				
Mx 5 data review/checkout	Feb-19	Feb-19	02/15/19	
Mx 6 data review/checkout	May-19	May-19	05/17/19	
Mx 7 data review/checkout	Sep-19	Sep-19	08/22/19	

Highlights:

Averaged NOAA-20 and SNPP Bias (%) Spectrum



Averaged SNO-based biases (%) between NOAA-20 and SNPP OMPS NM SDR reflectance is within 2% for all bands

Accomplishments / Events:

- Completed the SNPP reprocessed data maturity review (highlights)
- The development of web interface for VIIRS reprocessed data dissemination is under test
- New round of SNPP OMPS-NP reprocessing with bi-weekly solar update is on-going, and will be finished by Nov. 30, 2019
- New round of SNPP ATMS reprocessing with bi-weekly solar update is on-going, and will be finished by Nov. 30, 2019
- Preparation of a peer-review journal paper for SNPP SDR Reprocessing is ongoing
- Transition of the reprocessed SNPP SDR data to NCEI/CLASS is ongoing

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Finish 2016 VIIRS V2 reprocessing	Feb-19	Feb-19	Feb-19	N/A
Finish the remaining VIIRS V2 reprocessing	July-19	July-19	July-19	N/A
Compared cloud mask produced by VIIRS V2 reprocessed data and CLASS data	Aug-19	Aug-19	Aug-19	N/A
Reprocessed data maturity review	Sept-17	Sept-17	Sept-17	N/A
Develop VIIRS reprocessing data dissemination interface	Nov-30	Nov-30		
Perform OMPS-NP, ATMS V2 Reprocessing	Nov-30	Nov-30		
Reprocessing paper/report	Mar-20	Mar-20		

Overall Status:

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

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

Issues/Risks:

None

Highlights: SNPP Reprocessing Data Validated Maturity Review

Summary from Review Panel

- The review team acknowledges all the science teams for their efforts and hard work in preparing for this review and calibrating/validating work for the SNPP reprocessed SDR products.
- Project supports NOAA mission goals with clearly identified users
- All the reprocessed ATMS, CrIS, VIIRS, and OMPS SDRs meet validated maturity requirements

Path Forward

- Documentation: For each instrument (e.g., ReadMe) as well as the entire project
- User engagement:
 - Complete webpage for user access to the reprocessed datasets
 - Communicate with users for feedbacks (through emails and attending conferences)
- Publish results on impact studies
- Reprocess SNPP again using latest calibration algorithms
- Reprocess NOAA-20 when it is long enough and calibration algorithms are not updated any more
- Reprocess future JPSS satellites
- Reprocess EUMETSAT-ESA SG satellites if required

Accomplishments / Events:

- Processed S-NPP and NOAA-20 OMPS-NM data to generate Simultaneous Nadir Overpass (SNO) pairs with GOME-2 observations and generated OMPS-NM vs GOME bias, as well as double-difference, time series to evaluate NOAA-20 OMPS-NM data quality for NOAA-20 OMPS SDR validated review
- Compared NOAA-20 OMPS SDR data generated by NOAA IDPS and NASA to evaluate OMPS SDR data quality caused by different SDR calibration algorithms.
- Evaluated NOAA-20 and S-NPP CrIS scene select module (SSM) position error impact on SDR data
- Generated NOAA-20/S-NPP VIIRS vs GOES-16/17 ABI SNO match up data to evaluate VIIRS data quality and NOAA-20 vs S-NPP VIIRS bias using double difference technique
- Monitored hurricane Dorian intensity by producing hurricane warm core temperature vertical distribution using MiRS temperature profiles
- Prepared for upcoming AMS joint satellite conference in Boston
- Supported JPSS/SMCD weekly/monthly reports

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			

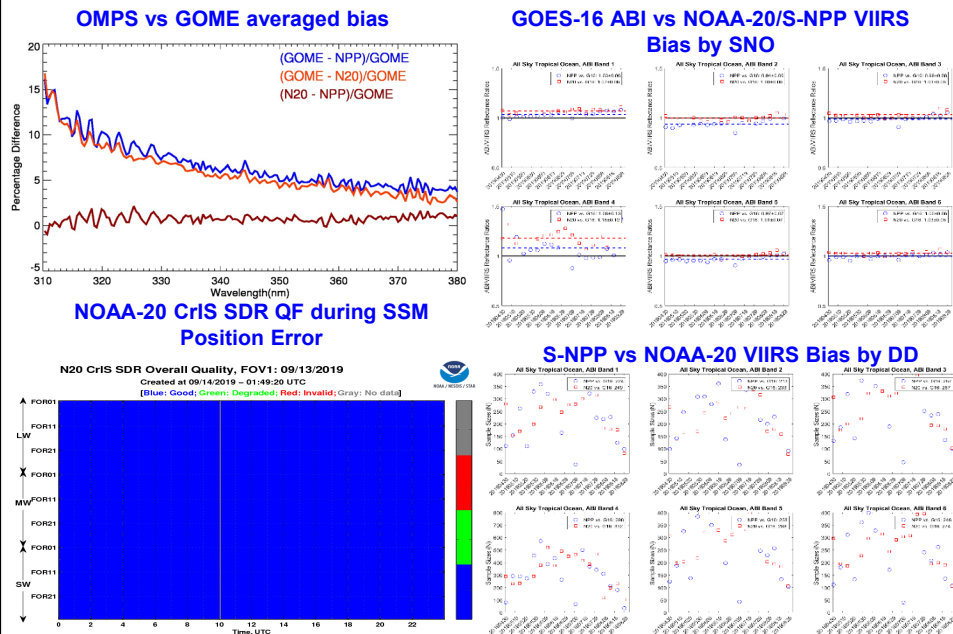
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Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
ICVS-Application: ICVS Severe Weather Watch (iSEW) System (Severe Weather Watch with JMAPP) (Beta Version)	Dec-18	Dec-18	Dec-18	
ICVS User's Manual and Technical Report Version 1	Mar-19	Mar-19	Mar-19	
ICVS Modules' initialization or improvement (each instrument on both SNPP and NOAA-20): <ul style="list-style-type: none"> Global (POES) Inter-Sensor Comparison Modules VIIRS/CrIS & GOES ABI Comparison Module Global O-B and Double Difference Bias Modules RDR/SDR Operational Data Missing Granule Modules CrIS/VIIRS geolocation monitoring module implementation and improvement CrIS FOV(R)-To-FOV(R) Difference modules CrIS Relative (Absolute) Spectral Difference Modules 	Jun-19	Jun-19	Sept-19	SNPP CrIS MW band electronic circuits switch from side 1 to 2; support N20 OMPS NM validated review; more efforts on SNO analysis
ICVS Module development and update: <ul style="list-style-type: none"> Inter-Sensor Comparison Module update O-B and DD Bias Module Update ICVS Geolocation Accuracy Trending Modules Enterprise ICVS Cloud/Clear Flag Modules ICVS SDR Spectral Analysis Modules ICVS Severe Weather Watch (iSEW) Update 	Sep-19	Dec-19		Support to N20 OMPS NP review; more efforts on inter-sensor analysis; prepare for 2019 Joint Satellite Conference
JPSS-ICVS System Standardization and ICVS Annual Performance Review	Sep-19	Feb-20		SJASTM: Feb-20

Highlights: Significantly contribute to STAR SDR Teams



Accomplishments / Events:

- **Terrain-Corrected EDR Imagery ARR:** The TC code-change was presented at the Algorithm Readiness Review (ARR) on 5 Sep 2019. Although the presentation passed the requirements for the review, the slide package will be corrected/updated in a few deficient areas, including: 1) an example applied to granules from different satellites or orbits, showing the stability of TC Imagery; 2) an evaluation of the TC Imagery by the NWS' Office of Observations, in lieu of SAB, which does not use VIIRS EDR Imagery, only SDRs.
- **NCC LUT update:** Plots of the new NOAA-20 DNB-to-NCC LUTs have been created and will be compared to the current LUTs used for NOAA-20. The temporal variability of the plots appears to be small and will likely not result in any significant visual differences in the NCC Imagery. (S. Finley, C. Seaman)

Overall Status:

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

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

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
NOAA-20 and SNPP cross verification	Sep-19	Dec-19		
Annual VIIRS Imagery performance report	Aug-19	Feb-20		SJASTM: Feb-20
N20 NCC LUT update	Sep-19	Dec-19		
Terrain-Correction geo-locations for VIIRS Imagery EDRs (ADR8239)				
Design Review	Mar-19	Mar-19	03/14/19	
Algorithm Readiness Review (ARR)	Sep-19	Sep-19	09/05/19	
DAP to DPES	Sep-19	Sep-19	09/30/19	
Run ADL locally (@ CIRA, to allow code testing/changes)	May-19	May-19	May-19	
IDPS Mx build I&T deploy regression support:				
Mx 5 data review/checkout	Mar-19	Mar-19	02/15/19	
Mx 6 data review/checkout	May-19	May-19	05/17/19	
Mx 7 data review/checkout	Sep-19	Sep-19	08/21/19	

Highlights:

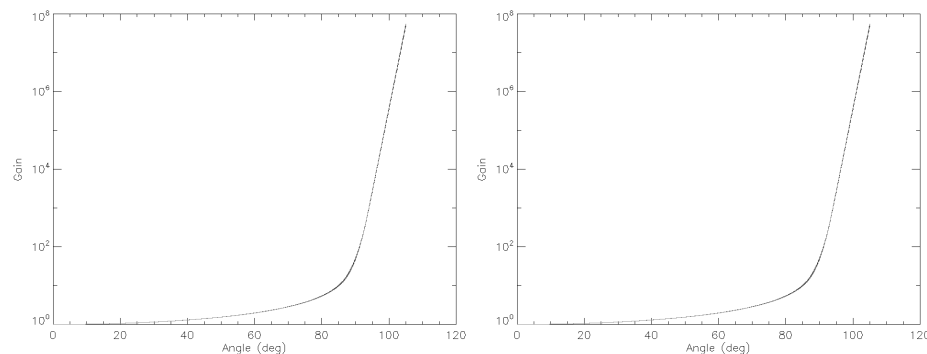


Figure: Solar and Lunar DNB-to-NCC Look Up Tables (LUTs), which appear similar to each other, but are applied differently in the NCC code. These LUTs are more-commonly called the GVVSSSE and GVVSSLE, or Solar and Lunar "Goosey" tables..

Accomplishments / Events:

- Cloud cover layer update was delivered adding product quality flag.
- DCOMP update was delivered with new LUT coefficients for VIIRS.
- Cloud mask and cloud top height codes are both being prepared for delivery.
- The NUCAPS cloud fraction data are ingested into CLAVR-x for testing the impact on cloud mask product.

Overall Status:

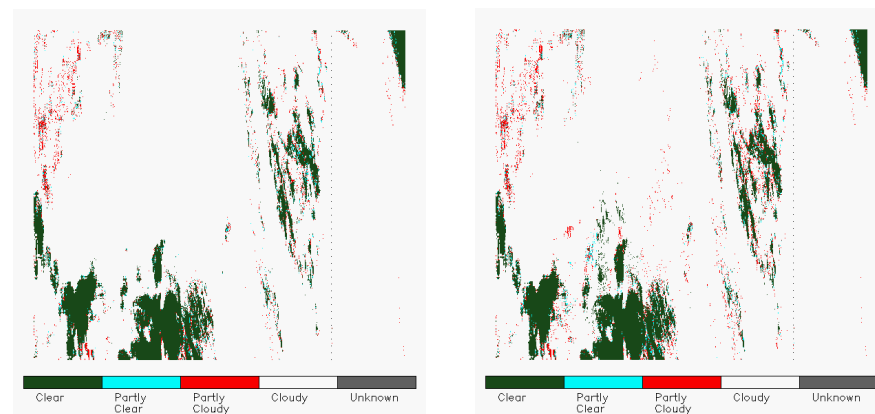
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Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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Issues/Risks:

None

Highlights: Using NUCAPS Cloud Fraction



No NUCAPS

With NUCAPS

Cloud mask for a VIIRS granule on 09/11/2018 at 0103UTC. The image on the left shows result without using NUCAPS, and the one on the right shows that using NUCAPS cloud fraction as a prior value. The impact on cloud mask retrieval is being studied.

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Beta/Provisional Maturity: NCOMP (N20 Cal/Val)	Feb-19	Feb-19	03/21/19	ppt ready
Provisional Maturity: DCOMP (N20 Cal/Val)	Nov-18	Nov-18	11/27/18	
Provisional Maturity: Cloud Mask, Cloud Phase (Beta & Provisional), ACHA (CTT/CTP/CTH), CBH			10/02/18	
Validated Maturity (N20 Cal/val)	May-19	May-19	05/16/19	
Final DAP (N20 Algorithm Adjustment)	Mar-19	Mar-19	03/11/19	
Algorithm update DAP to ASSISTT: <ul style="list-style-type: none"> Cloud Mask: Develop new LUTs that support multi-dimension classifiers and provide full meta-data Cloud Phase/Type: Optimize cloud phase thresholds for NOAA-20 ACHA: improving multilayer ACHA by analysis of calipso observed cloud behavior to support Polar Winds CCL: Separate CCL from ACHA processing 	Mar-19	Oct-19		NDE maintenance schedule delay
Algorithm update DAP to ASSISTT: <ul style="list-style-type: none"> Cloud Mask: Implement DNB ACHA: Work on surface emissivity issues that are impacting 8.5 micron clear-sky BT CBH: Leverage GOES-RR to target characterization of overlapping cloud assess CBH performance for multi-layer cloud systems DCOMP: Incorporate improved surface reflectance for DCOMP channels DCOMP: Implement gross phase correction for DCOMP pixels that fail (thin cirrus over stratus is a common issue) NCOMP: extend NCOMP cloud optical depth range to include larger values by including a neural net approach 	Sep-19	Oct-20		NDE maintenance schedule delay

Accomplishments / Events:

- Two presentations at ESA Living Planet Symposium were made by team members Amy Huff and Pubu Ciren involving VIIRS aerosol products in Milan, Italy
- Revising STAR VIIRS aerosol cal/val website:
 - ✓ Add Aerosol Detection Product information
 - ✓ Add Enterprise Processing System (EPS) Aerosol Optical Depth information
 - ✓ Keep the IDPS version of the product information but make the EPS version the focus
 - ✓ Add information on episodic heavy aerosol events for blog applications
- Hired a new web developer/programmer, Ryan Theurer, to help the aerosol team with various aspects of web development
- Began working on development of the joint retrieval of aerosol index from VIIRS and TROPOMI
- Demonstrated the GOES-17 Advanced Baseline Imager (ABI) AOD and aerosol detection products to be at provisional maturity review **using VIIRS products as one of the many correlative measurements.**

Overall Status:

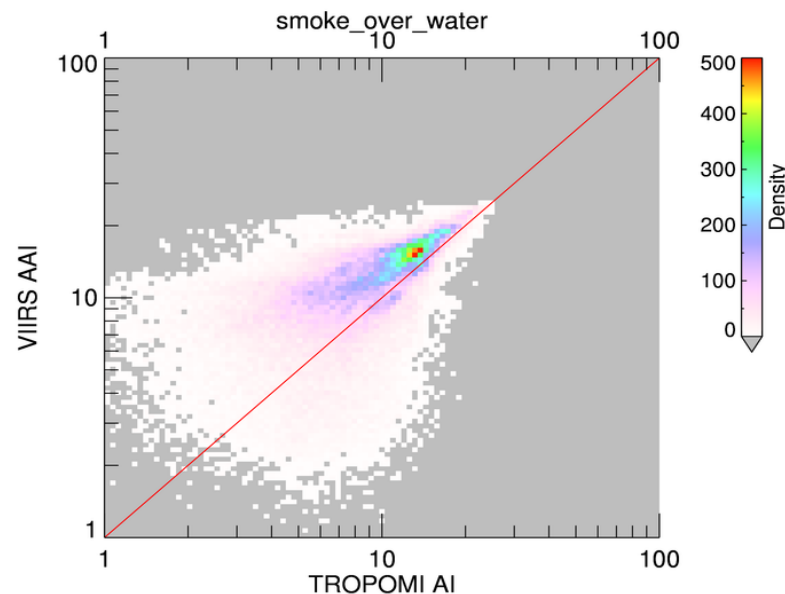
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Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Validated Maturity (N20 Cal/Val)	May-19	May-19	05/16/19	
Final DAP (N20 Algorithm Adjustment)	Mar-19	Mar-19	03/11/19	
Algorithm update DAP to ASSISTT:				
<ul style="list-style-type: none"> Revise the output quality flags (grouped based on the retrieval quality) AOD: Update internal tests (e.g., sea ice, heavy aerosol etc.) for SNPP and NOAA-20 ADP: algorithm updates to the IR-visible path (thresholds and quality flag determination) 	Mar-19	Mar-19	Mar-19	
Algorithm update DAP to ASSISTT:				
<ul style="list-style-type: none"> Algorithm update for heavy aerosol retrievals over dark land surface (high reflectance might trigger the retrieval over bright land) AOD: Update the bright surface reflectance database ADP: algorithm updates to improve (improve correct detection and minimize false detection) over bright surfaces using spectral surface reflectance data base 	Sep-19	Sep-19		
Enhancements to AerosolWatch website to add NOAA-20 data	Jun-19	Jun-19	June-19	



Comparison of VIIRS Absorbing Aerosol Index (AAI) with TROPOMI over water. Data shown for a few days in April/May 2019

Accomplishments / Events:

- Added to list of known NOAA-20 observations of non-trivial ash clouds
- Completed FY19 cal/val activities, including continuous assessment and comparisons to validation data
- Concluded that the combined VIIRS/CrIS utilized in VOLCAT is much more accurate than the current VIIRS EDR. The VIIRS volcanic ash EDR badly underestimates the height of well dispersed high level volcanic clouds, whereas the VIIRS/CrIS approach is much more consistent with validation 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		

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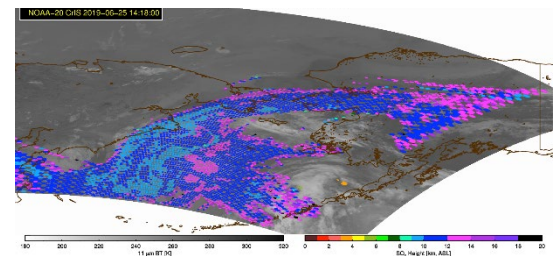
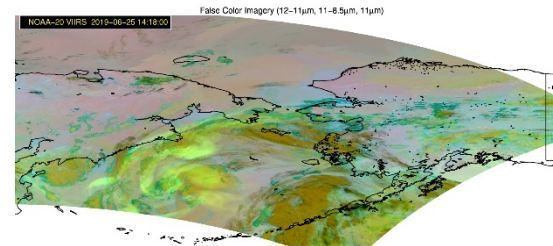
Issues/Risks:

The user request task is being worked, but will require much more time to complete since we need to completely reformulate the requirements.

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Beta Maturity (N20 Cal/Val)	Nov-18	Nov-18	11/27/18	
Provisional Maturity (N20 Cal/Val)	Nov-18	Nov-18	11/27/18	
Validated Maturity (N20 Cal/Val)	May-19	May-19	05/16/19	
Final DAP (N20 Algorithm Adjustment)	Mar-19	Mar-19	03/11/19	
Incorporation of CrIS	Sep-19	Sep-19	9/30/19	
Comparison of volcanic ash products with validation data	Sep-19	Sep-19	9/30/19	
Submit user request for the VOLCAT capability (implementation)	Mar-19	?		Still TBD as JPSS, GOES-R, and STAR determine the best way forward

Highlights:

CrIS volcanic cloud height mapped to VIIRS



Accomplishments / Events:

Continued monitoring of NOAA-20 and S-NPP sea ice concentration and ice surface temperature show good agreement between the two satellites. For ice concentration there an overall small bias with standard deviation (Std) and root-mean-square (RMS) differences ranging from 7% for Antarctic to 17% during the month of August. Both are well under the 25% requirement. Ice Surface Temperature (IST) comparisons also indicate minimal bias over both Arctic and Antarctic, with Std and RMS values ranging from 0.39 K over Arctic during July to 1.51 K over Antarctic during June.

Overall Status:

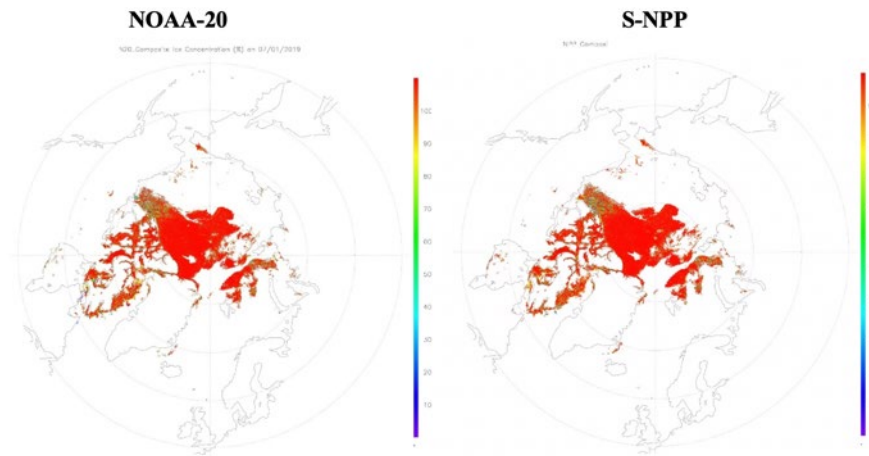
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Cost / Budget		X			
Technical / Programmatic		X			
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Issues/Risks:

None

Highlights:



Arctic daily composites of ice concentration from NOAA-20 (left) and S-NPP (right) on 1 July 2019.

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Provisional Maturity (N20 Cal/Val)	Apr-19	Apr-19	05/16/19	
Final DAP (N20 Algorithm Adjustment)	Mar-19	Mar-19	03/11/19	
Offline Products:				
<ul style="list-style-type: none"> Snow: Establish routine generation of global gridded binary and fractional snow cover products on a daily basis IST: Begin routine production of I-band IST algorithm using only the 11 um I-band channel Ice Concentration: Start generating an I-band resolution product with available I-band IST 	Sep-19	Sep-19	Apr-19	
Algorithm Cal/Val:				
<ul style="list-style-type: none"> Snow: Compare N20 Snow with SNPP, MODIS, and IMS snow data. Provide an in-depth evaluation of the Binary Snow product over different surface cover types, topography and geographical regions IST: Compare N20 IST with SNPP, MODIS, IceBridge, and IABP IST Ice Concentration: Compare N20 ice concentration with NPP, MODIS, SAR, Landsat, SENTINEL-1&2, and IceBridge data Ice Thickness: Validate N20 ice thickness with NPP, IceBridge, CryoSat-2, SMOS, and ICESat-2 products 	Sep-19	Sep-19	May-19	
Algorithm Updates:				
<ul style="list-style-type: none"> Modify/add quality flags if needed Ice Concentration: Improve tie-point processing for marginal ice zone Ice Thickness: <ul style="list-style-type: none"> Ice growing/melting and dynamic adjustment factors Snow depth climatology and interface temperature between ice and snow Use weekly or bi-weekly running mean temperature 	Sep-19	Sep-19	May-19	

Accomplishments / Events:

- Worked with ESRL, EMC and OSPO on issues related to the operational implementation of HRRR-smoke
- Worked with the STAR Suomi NPP reprocessing and SDR teams on the evaluation of the reprocessed VIIRS data record for fire monitoring
- Investigated anomalies identified in the reprocessed VIIRS data record
- Supported assessment of VIIRS fire observations of major fire events

Overall Status:

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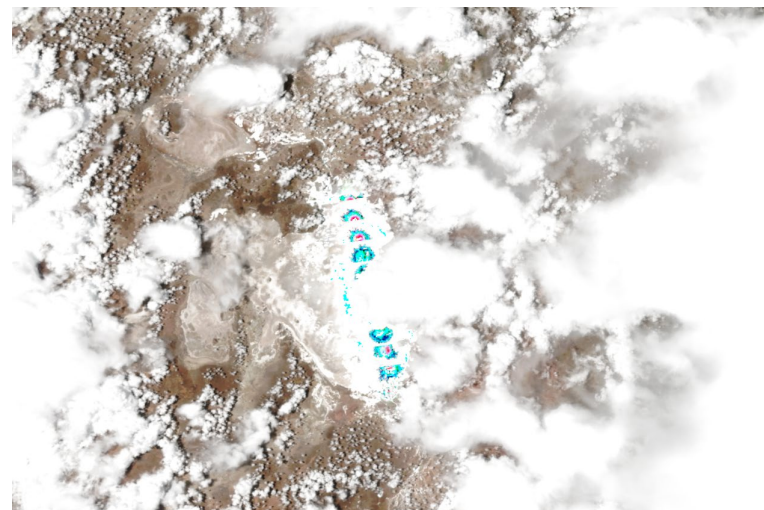
Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
S-NPP / NOAA-20 data analysis	Sep-19	Sep-19		
<i>I-Band Active Fires algorithm development and Cal/Val</i>				
User request for I-Band Active Fires	Mar-19	Mar-19	Feb-19	
Delta design review for I-band AF (Beta Maturity)	Apr-19	Apr-19	05/16/19	
Algorithm readiness review for I-band AF (Provisional Maturity)	Sep-19	Sep-19	05/16/19	Review panel's recommendation
I-Band AF DAP deliver to NDE	Sep-19	Sep-19		Initial DAP delivered to ASSIST. Final DAP forthcoming

Highlights:

<https://www.star.nesdis.noaa.gov/jpss/mapper/>



Suomi NPP VIIRS true color image from 1/10/2017

An example of excessive radiance assumed to be caused by reflection from standing water over a bright salt flat in South America, after a rain event. Multiple VIIRS bands were saturated during this event.

Accomplishments / Events:

- The team continued planning for further code and algorithm improvements to ensure consistency with upstream and downstream products. Major issues include:
 - Updates to several cloud-related flags
 - Removal of internal conversions between HDF5 and netCDF4
 - Removal of remaining ADL components

Overall Status:

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

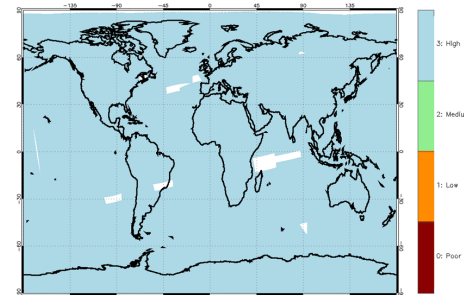
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Issues/Risks:

None

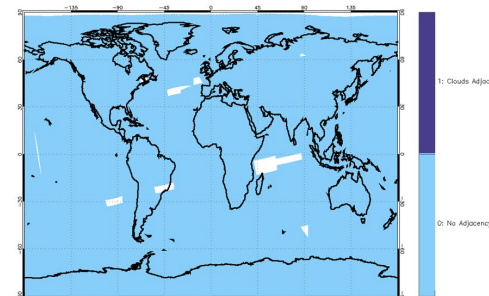
Highlights:

Examples of cloud quality flags planned to be updated in the VIIRS Surface Reflectance product. Data from NOAA-20 VIIRS, February 13, 2019



Top: Cloud Mask Quality

Bottom: Cloud Adjacency



Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Provisional Maturity (N20 Cal/Val)	Feb-19	Mar-19	03/21/19	Feb/Mar combined
Final DAP (N20 Algorithm Adjustment)	Apr-19	Apr-19	02/15/19	Feb patch DAP
S-NPP / NOAA-20 data analysis	Sep-19	Sep-19		
Patch delivery (fixed the Aerosol look-up tables wrong index issue)			11/21/18	
Patch delivery (fixed wrong values issue for the production_site and production_environment global attributes)			12/19/18	
Patch delivery (fixed latitude/longitude logic so that the system doesn't record -999.3 values for the last scanline global attributes)			02/15/19	

Accomplishments / Events:

- Downloaded and processed S-NPP VIIRS observations acquired in September 2019 to create daily mosaics (up to the writing of this report)
- Conducted a systematic evaluation of NOAA-20 VIIRS data against SNPP data for global surface type monitoring
 - Presented results to the NOAA-20 Beta Review Panel for Surface Type
- Delivered the final VIIRS AST18 product suite to STAR for public release from its ftp server, including:
 - Global maps with 17 IGBP types in Sinosoidal and Lat/Long
 - Global map with 20 types for use by NOAA modelers

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

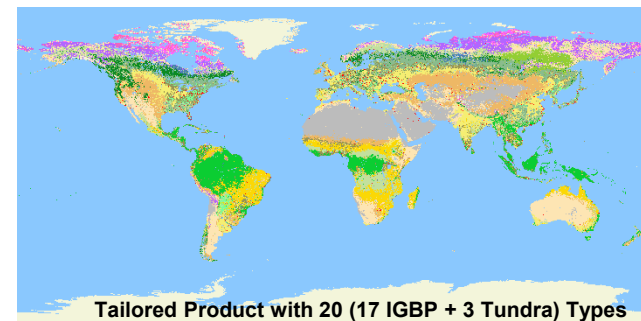
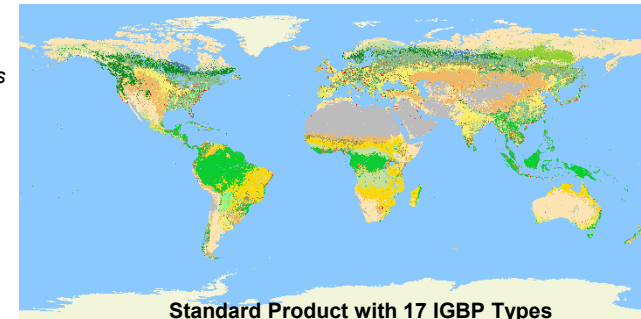
Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Beta Maturity (N20 Cal/Val)	Jul-19	Sep-19	09/19/19	
Provisional Maturity (N20 Cal/Val)	Sep-19	August-20		
Annual performance report	Aug-19	Feb-20		SJASTM: 2/20
AST18 (Annual Surface Type):				
Complete monthly composites of global gridded VIIRS data (9 land bands + thermal bands) for VIIRS AST18 based on 2018 VIIRS data	May-19	May-19	May-19	
Generate VIIRS AST18 based on 2018 VIIRS data using SVM algorithm	Aug-19	Aug-19		
Comparison of AST18 with surface type validation data (Accuracy statistics of the new AST18 and LWM)	Sep-19	Sep-19	Sep-19	
Delivery of AST18 (available for users through STAR FTP)	Sep-19	Sep-19	Sep-19	
Communicate with EDRs and ASSISTT teams on switching to use VIIRS AST	Mar-19	Mar-19	Mar-19	

Highlights:

Annual Surface Type Maps derived from 2018 SNPP data

Surface Types

- Evergreen Needleleaf Forests
- Evergreen Broadleaf Forests
- Deciduous Needleleaf Forests
- Deciduous Broadleaf Forests
- Mixed Forests
- Closed Shrublands
- Open Shrublands
- Woody Savannas
- Savannas
- Grasslands
- Permanent Wetlands
- Croplands
- Urban and Built-up Lands
- Cropland/Natural Vegetation Mosaics
- Snow and Ice
- Barren
- Water Bodies
- Wooded Tundra
- Mixed Tundra
- Bare Ground Tundra



Accomplishments / Events:

- Finished the inter-comparison between L3 J01 VIIRS LST and SNPP VIIRS LST using the reprocessed data for 32 day repeating cycle. The results indicate that they are consistent.(slide 2-3)
- Finished the L3 LST product validation using ground measurements from SURFRAD and BSRN for cross satellite comparisons among L3 AQUA MODIS LST(MYD11A1, MYD21A1) and NASA SNPP VIIRS LST(VNP21A1). (highlights and slide 4)
- Cooperated with ASSISTT group on the code updates according to the comments from the software code review.
- Finalized the gridded VIIRS LST ARR review slide.
- The L3 gridded product ARR was successfully held on Sep. 24, 2019.
- The NDE VIIRS LST is available at CLASS under the group of "JPSS VIIRS Product(granule)(JPSS-GRAN)". Both SNPP and J01 LST are in the updated version v1r2.
- Found an issue with geometry data in the LST output. Has reported to ASSISTT group for verification and fix. This issue has no impact on the LST value.
- A manuscript titled "Enterprise LST algorithm development and evaluation with NOAA 20 data" has been revised and finally been published at Remote Sensing Journal.

Overall Status:

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

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

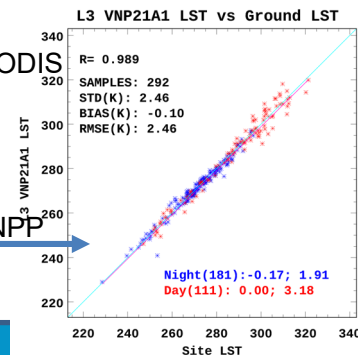
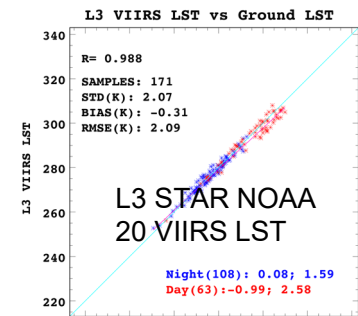
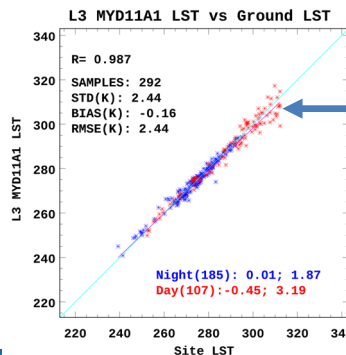
Issues/Risks:

Schedule change due to the government shutdown

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Operational Readiness Review (ORR)	Nov-18	Nov-18	11/16/18	
Provisional Maturity (N20 Cal/Val)	Feb-19	Feb-19	03/21/19	Impact of Shutdown
Final DAP (N20 Algorithm Adjustment)	Mar-19	Mar-19	03/11/19	Impact of Shutdown
NOAA-20 LUT update	Apr-19	Apr-19	Apr-19	
Cal/Val tool development (SNPP & J1 comparison)	Apr-19	Apr-19	Apr-19	
Deep-dive analysis software package for the anomaly watch	Sep-19	Sep-19	Sep-19	
Global gridded LST				
Critical Design Review (CDR)			10/23/18	
Unit Test Readiness Review (UTRR)	Feb-19	Feb-19	03/12/19	scheduled
Initial DAP to NDE	Mar-19	Mar-19	03/01/19	
Algorithm Readiness Review (ARR)	Jul-19	Aug-19	09/24/19	
Final DAP to NDE	Jul-19	Aug-19	09/30/19	

Highlights:

Ground data validation of L3 AQUA MODIS LST (MYD11A1, bottom left), STAR L3 NOAA 20 VIIRS LST (top right) and NASA SNPP VIIRS LST (VNP21A1, bottom right) for the time period of Feb. 01, 2019 to June 12, 2019.



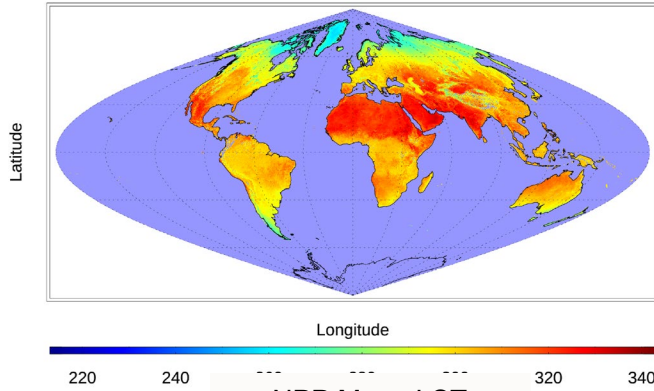
L3 AQUA MODIS LST

NASA L3 SNPP VIIRS LST

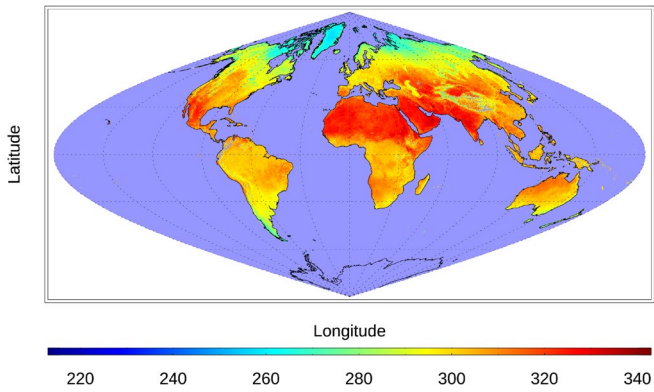
Inter-comparison- L3 J01 LST and SNPP LST (Daytime)

L2 32-Day LST Diff Mean: Daytime (131-162, 2019)

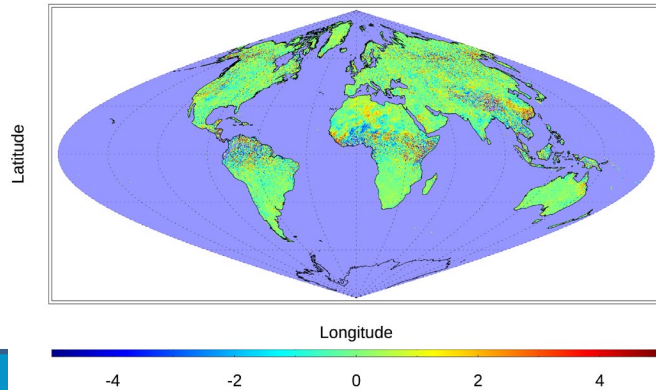
J01 Mean LST



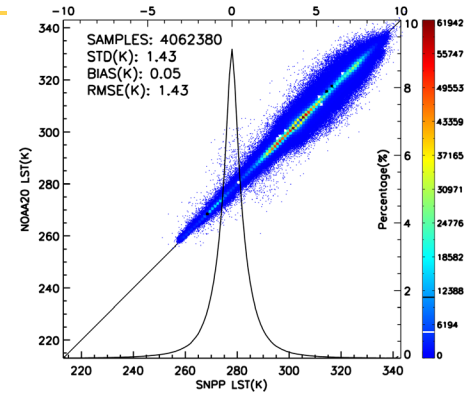
NPP Mean LST



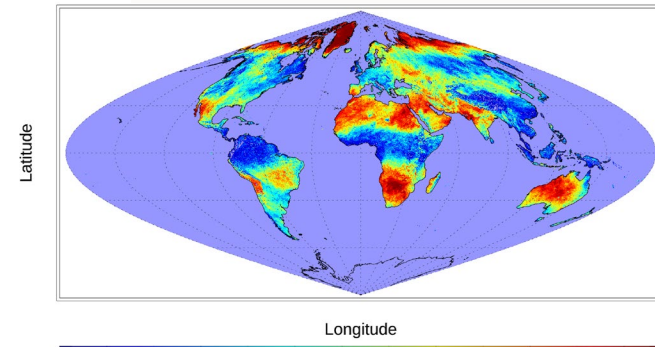
Enterprise Gridded LST Mean Diff



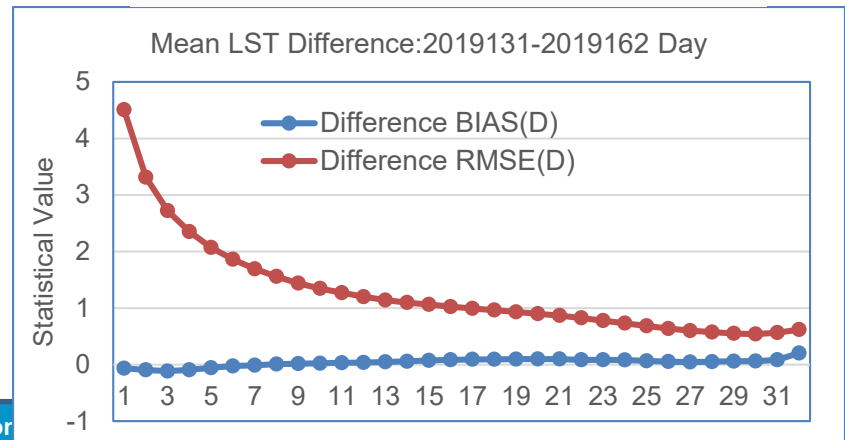
SNPP vs NOAA20 LST on 2019131-2019162 D



Data Availability Distribution



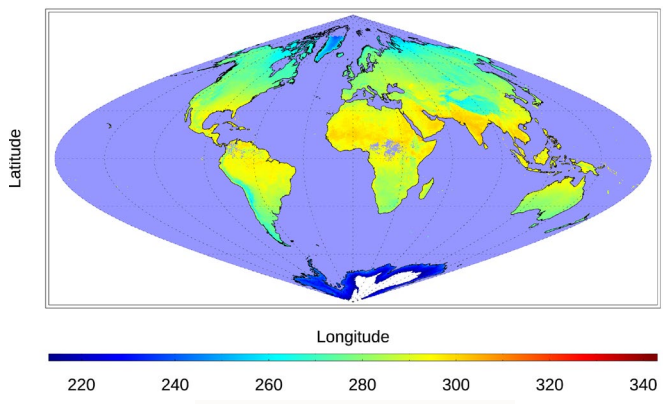
Difference Statistics over Data Availability



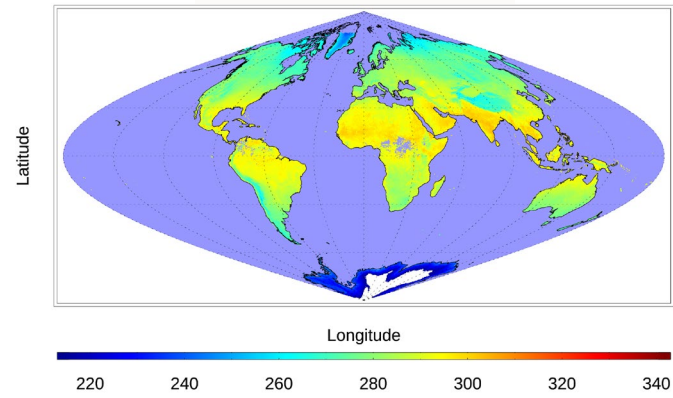
Inter-comparison- L3 J01 LST and SNPP LST (Nighttime)

L2 32-Day LST Diff Mean: Nighttime (131-162, 2019)

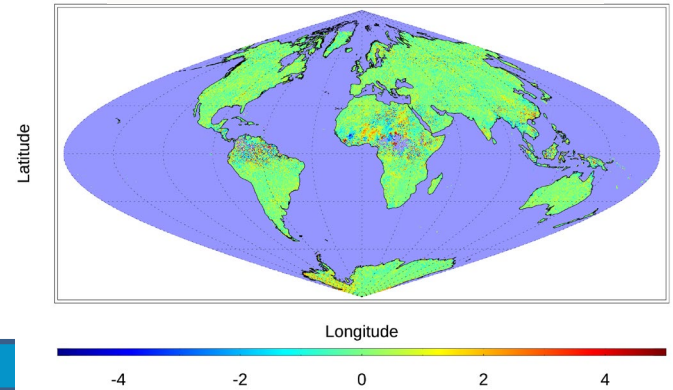
J01 Mean LST



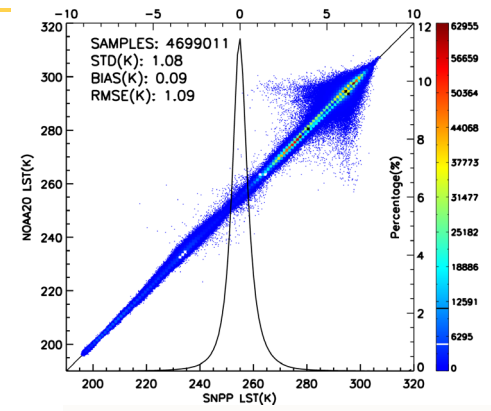
NPP Mean LST



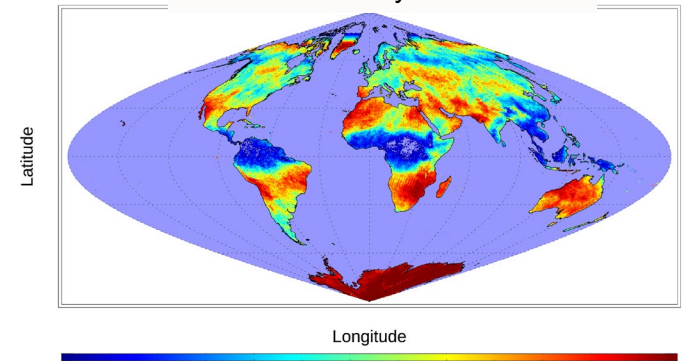
Enterprise Gridded LST Mean Diff



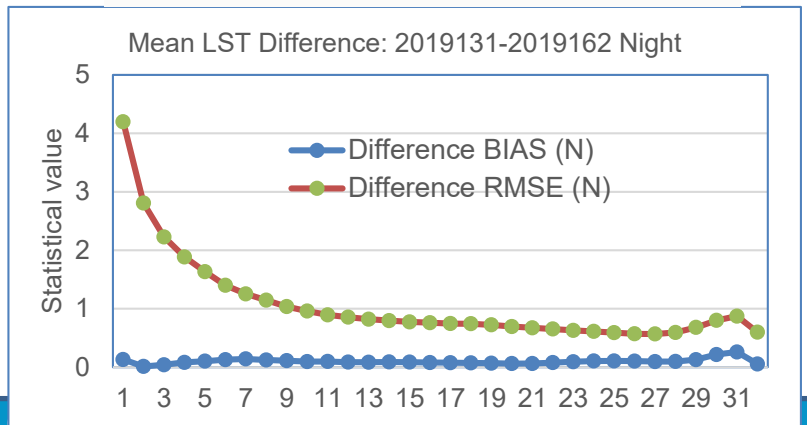
SNPP vs NOAA20 LST on 2019131-2019162 N



Data Availability Distribution

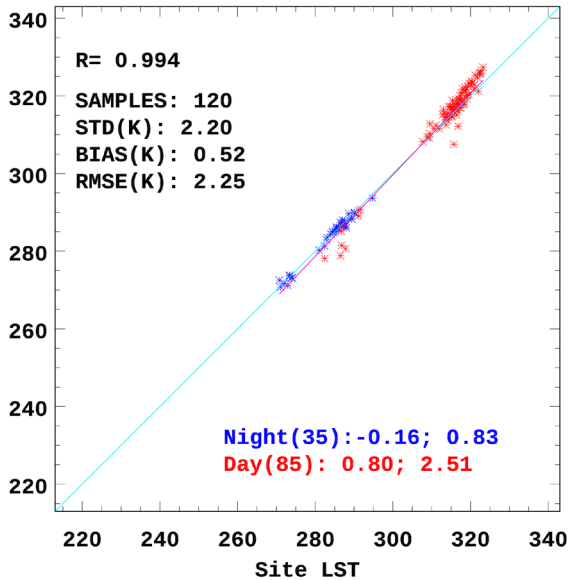


Difference Statistics over Data Availability



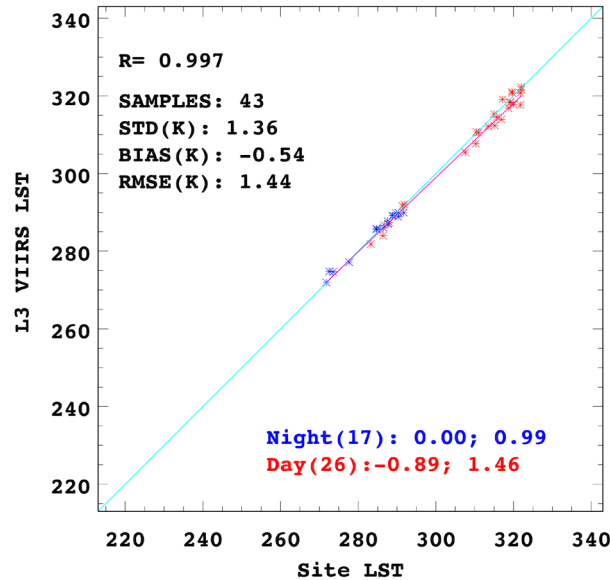
MYD11A1: L3 AQUA MODIS LST

L3 MYD11A1 LST vs Ground LST



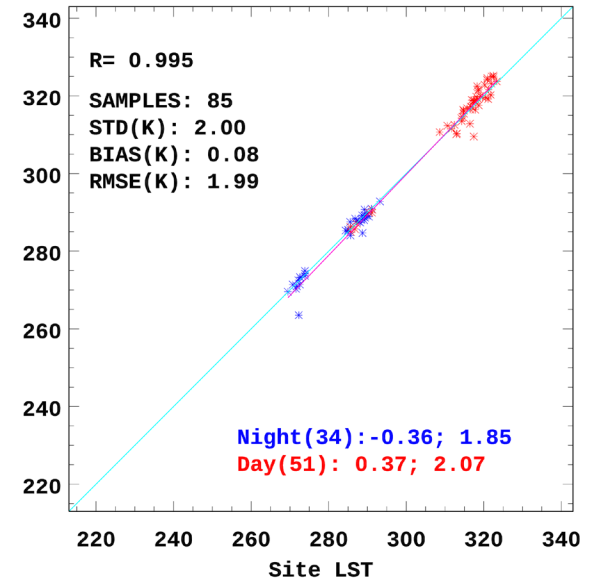
L3 J01 VIIRS LST

L3 VIIRS LST vs Ground LST



VNP21A1: L3 SNPP VIIRS LST

L3 VNP21A1 LST vs Ground LST



For the same time period: Feb. 01, 2019 to June 12, 2019

- Same matchup procedure
- Matchup number difference might be caused by the missing data in our L3 data set

Accomplishments / Events:

- Passed the Algorithm Readiness Review of Gridded surface albedo product with meeting all the enter/exit criteria for the ARR according to the review team.
- Reviewed the user request through preparing for the Product Line Plan slides
- Published the J01 and SNPP VIIRS Surface Albedo in NOAA CLASS system since 09/18/2019 (currently operational is the v1r2 version).
- Updated the monitoring system to handle the enterprise albedo product, with the system re-written in Python instead of IDL for the efficiency of mending h5 L1b data so that no more bow-tie gaps (**Slide #2**).
- Simplified the enterprise algorithm flow for the preparation of producing blended albedo from both SNPP and NOAA-20 observations

Overall Status:

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

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

Issues/Risks:

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Provisional Maturity (N20 Cal/Val)	Feb-19	Mar-21	Done	
Final DAP (N20 Algorithm Adjustment)	Mar-19	Mar-21	Delivered to AIT	
NOAA-20 LUT update	Apr-19	Apr-19	Delivered	
New 1-km albedo climatology dataset delivery	Apr-19	Apr-19	Apr-19	Submitted
Cal/Val tool development (SNPP & J1 comparison)	Apr-19	Apr-19	Done	
Deep-dive analysis software package for the anomaly watch	Sep-19	Sep-19	Done	
Global gridded LSA				
Critical Design Review (CDR)			10/23/18	
Unit Test Readiness Review (UTRR)	Mar-19	Mar-19	03/12/19	
Initial DAP to NDE	Mar-19	Mar-19	03/01/19	
Algorithm Readiness Review (ARR)	Jul-19	Aug-19	09/24/19	
Final DAP to NDE	Jul-19	Aug-19	09/30/19	

Highlights:

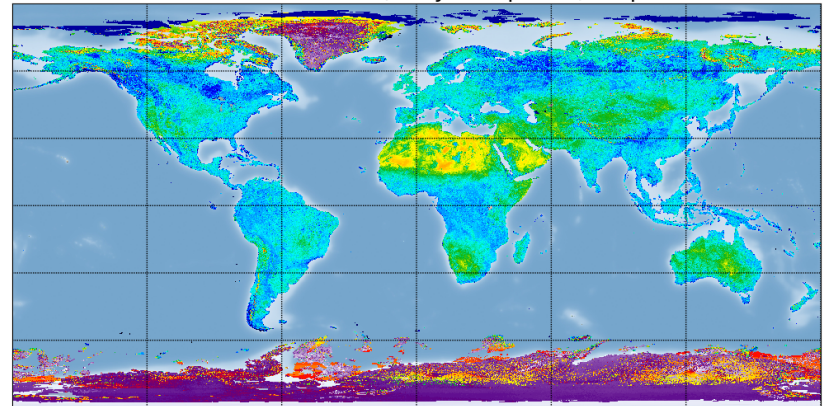
VIIRS Sea ice albedo dynamic during the melting season



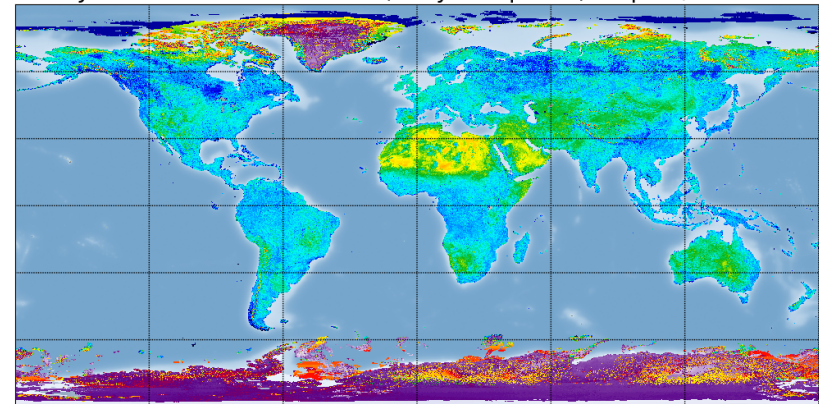
New version VIIRS surface albedo operational

- ❑ The SNPP VIIRS Surface albedo (SURFALB) has been updated to the v1r2 version in the CLASS system
- ❑ The NOAA-20 VIIRS Surface albedo (SURFALB) has been released in the CLASS system
- ❑ Science team has adapted the local monitoring system for handling the new enterprise albedo product.
- ❑ The system was rewritten in Python code to improve the efficiency of L1B data mending and in-situ match-up subsetting.
- ❑ The monitored in-situ measurement networks have included the ARM-SGP, BSRN, and NEON to expand the validation ability worldwide.

SNPP VIIRS Global Albedo (Daily Composite): Sep 24, 2019



JPSS1 VIIRS Global Albedo (Daily Composite): Sep 24, 2019

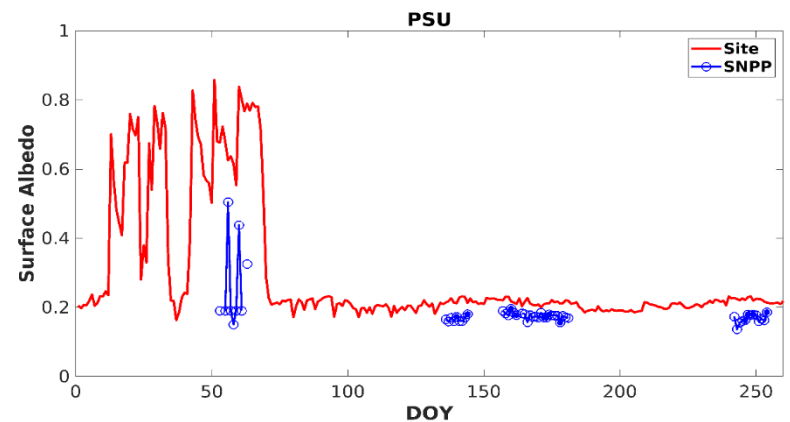
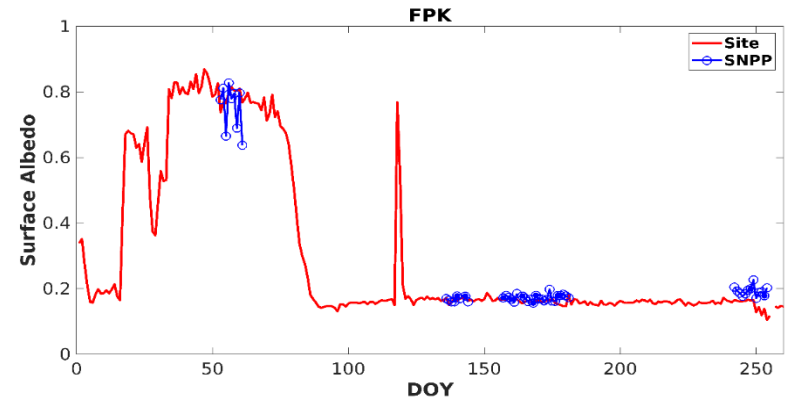
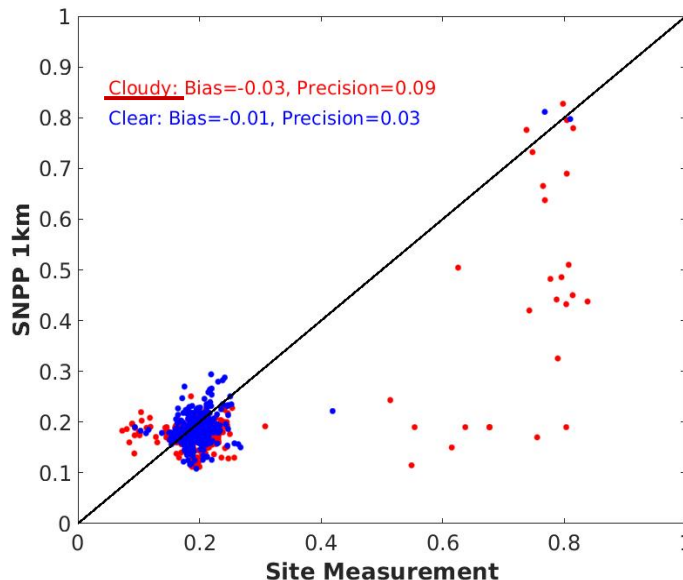


Continued in-situ validation of the VIIRS

SURFALB

- The L3 gridded SNPP albedo was continuously validated using sample data from different seasons.
- It is shown that the clear-sky retrievals can catch the albedo surface dynamic during snow season, like in FPK site.
- When continuous cloudy conditions is met during the snow season, the backup retrieval from climatology data may not reflect the surface albedo correctly, like in PSU site during February.

Validation and improvement over snow surface is a main direction to improve our albedo product.



Accomplishments / Events:

- Detailed investigation was conducted to find the cause of the lower GVF values in the operational SNPP/J1 GVF after code update on June 4, 2019
- Cooperated with NDE and OSPO, we found a bug in a shell script in the GVF code, which is designed to run at the NDE side, and fixed the bug.
- Operational GVF file size issue was fixed and the GVF file size is changed back to the normal level (13 MB)
- Produced NOAA-20 GVF from Aug 1 to Aug 31, 2019 at the local computer for validation

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			

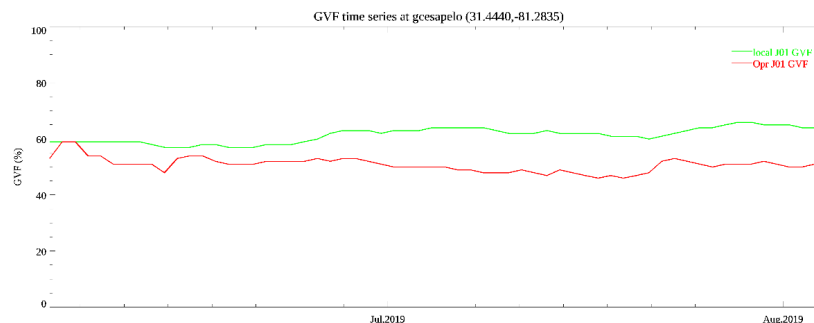
1. Project has completed.
2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Provisional Maturity (N20 Cal/Val)	Mar-19	Mar-19	03/21/19	
Initial DAP (N20 Algorithm Adjustment)	Nov-18	Nov-18	11/30/18	11/15/18 to ASSISTT
Final DAP (N20 Algorithm Adjustment)	May-19	May-19	05/30/19	On time
NVPS algorithms optimization and improvement	Apr-19	Apr-19	07/31/19	
Cal/Val tool development (SNPP & J1 comparison)	Jun-19	Jun-19		
Deep-dive analysis software package for the anomaly watch	Sep-19	Sep-19	09/26/19	

Highlights:



Operational J01 GVF is lower than the local run J01 GVF at testing sites after Jun 20, 2019

Accomplishments / Events:

- Developed an IDL package to make regression analysis among VIIRS NVPS VI products in different operating environments (e.g., in NDE and in STAR) or other products, such as, MODIS VI products (refer to detailed description in highlights)
- Regression analysis results shows complete consistence between VIIRS NVPS VI products in NDE environment and those in STAR environment in following cases: (refer to additional slides)
 - Daily global and regional VIs on 01/06/2019
 - Weekly global and regional VIs in period from 12/31/2018 to 01/06/2019
 - Biweekly global and regional VIs in period from 12/22/2018 to 01/06/2019

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: The government shutdown seriously impacted the NOAA-20 VIIRS VI algorithms optimization and improvement, and it will be rescheduled a month later (July, 2019)

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Provisional Maturity (N20 Cal/Val)	Mar-19	Mar-19	03/21/19	
Initial DAP (N20 Algorithm Adjustment)	Nov-18	Nov-18	11/30/18	11/15/18 to ASSISTT
Final DAP (N20 Algorithm Adjustment)	May-19	May-19	05/30/19	On time
NVPS algorithms optimization and improvement	Apr-19	Apr-19	07/31/19	Rescheduled to gov. shutdown
Cal/Val tool development (SNPP & J1 comparison)	Jun-19	Jun-19		
Deep-dive analysis software package for the anomaly watch	Sep-19	Sep-19	09/26/19	

Highlights:

IDL Package for Regression Analysis

This IDL package aims to make regression analysis among VIIRS NVPS VI products in different operating environments (e.g., in NDE and in STAR) or other products, such as, MODIS VI products. It is of following characteristics:

- ✓ including a basic procedure (compare_scatter.pro) to generate scatter plot, normalized histogram, statistic moments of any two variable data (e.g daily global NDVI_TOC in NDE environment against daily global NDVI_TOC in STAR environment)
- ✓ including a main procedure (vi_compare_scatter.pro) to do batch processing of the basic procedure, such as, for-loop on a multiple of dates, spatial resolutions (global, regional), temporal resolutions (daily, weekly, and biweekly), and products (EVI_TOC, NDVI_TOC, NDVI_TOA)
- ✓ Including utility procedures (lib_display.pro), such as, read data, attributes from netcdf or hdf files, string processing


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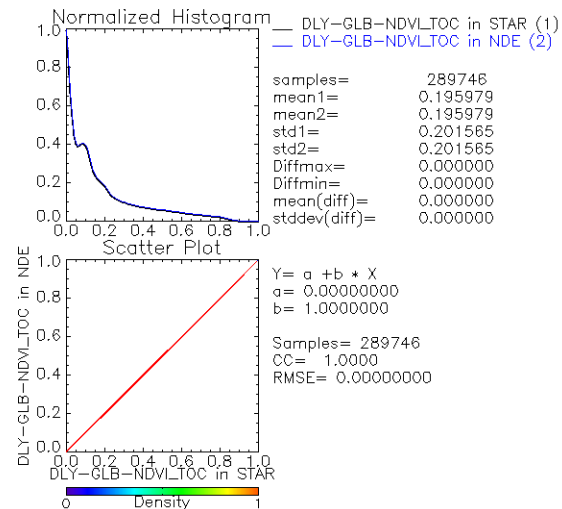
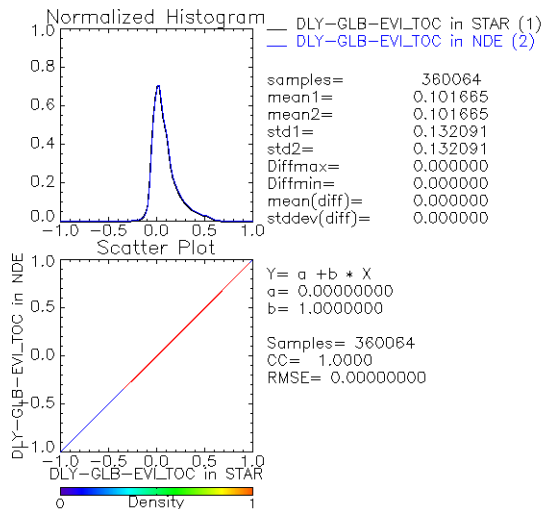
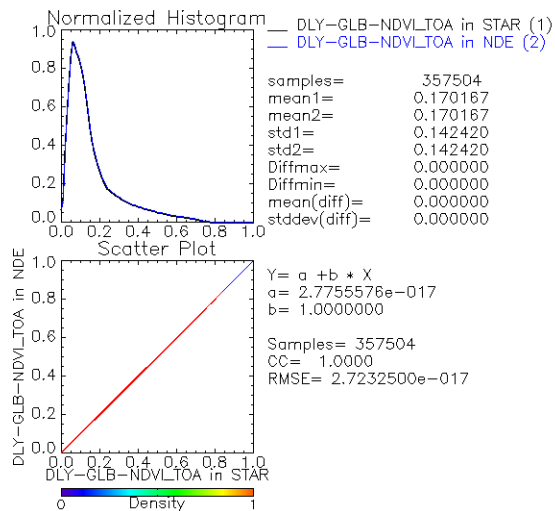
pro compare_scatter, XinFile, YinFile, Xname, Yname, Xtitle, Ytitle, $
  start, count, stride, outFileNames
; read sample data into X, Y under condition: start, count, and stride
hdf_read_sds, XinFile, Xname, X, start=start, count=count, stride=stride, /NOSCALE
hdf_read_sds, YinFile, Yname, Y, start=start, count=count, stride=stride, /NOSCALE
; read attribute values of Vname from XinFile and YinFile
HDF_readSDSAttribute, XinFile, Xname, att_name, attr_value=attr_value
; generate scatter plot, normalized histogram, statistic moments of updated X, Y
display_both_scatter_histogram, X1, Y1, range, $
  sd_names=[Xtitle, Ytitle], Nbins=100, $
  scatterplot_style= 1, $
  PercentageOfSlopeOnScatterPlot= PercentageOfSlopeOnScatterPlot, $
  RightPanel=RightPanel, $
  draw_FitLine=1, $
  statistic_param=statistic_param, regress_Param=regress_Param
save_png, outFileNames
end

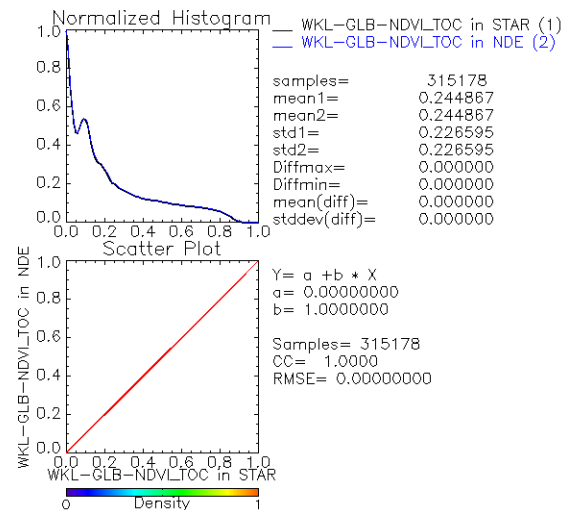
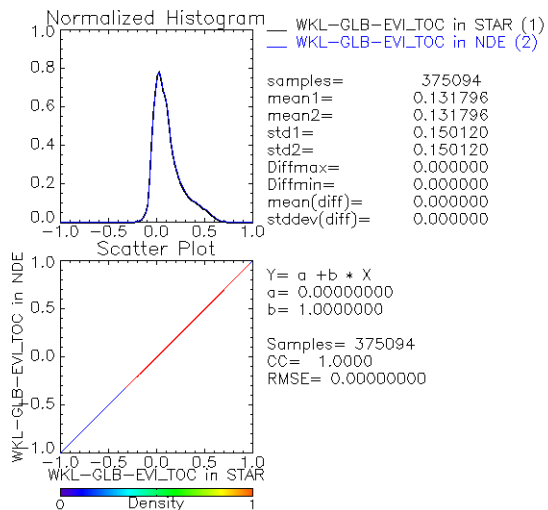
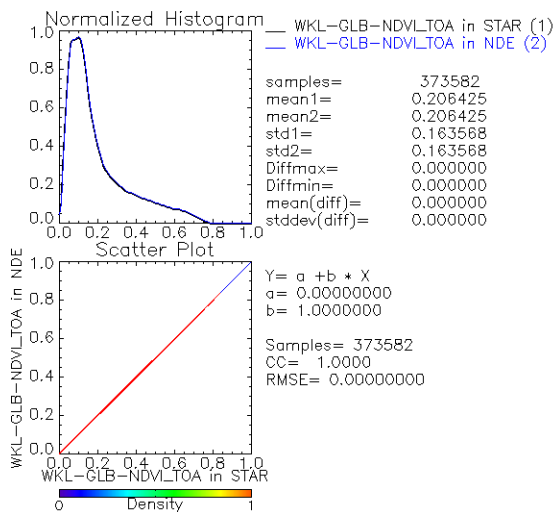
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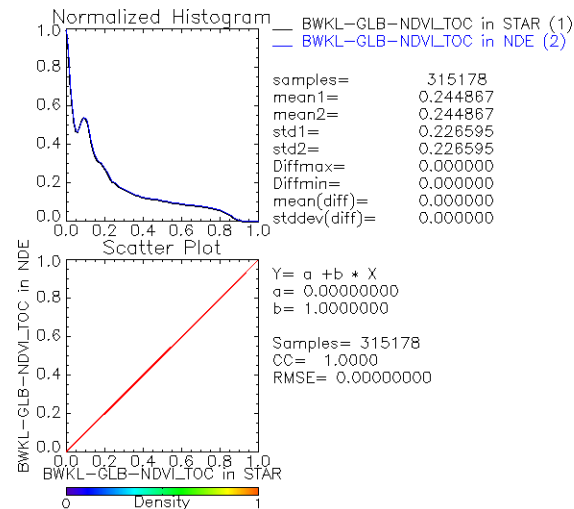
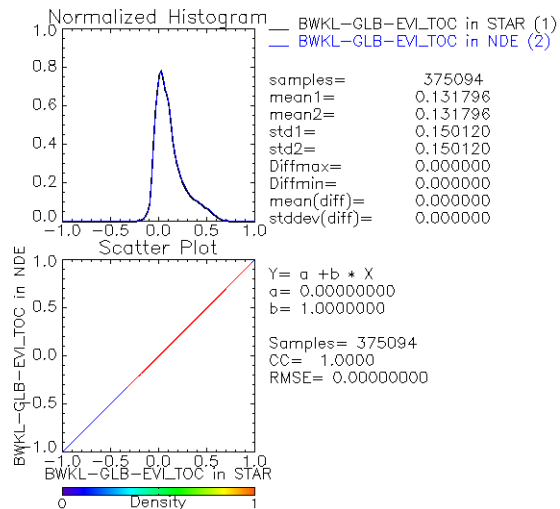
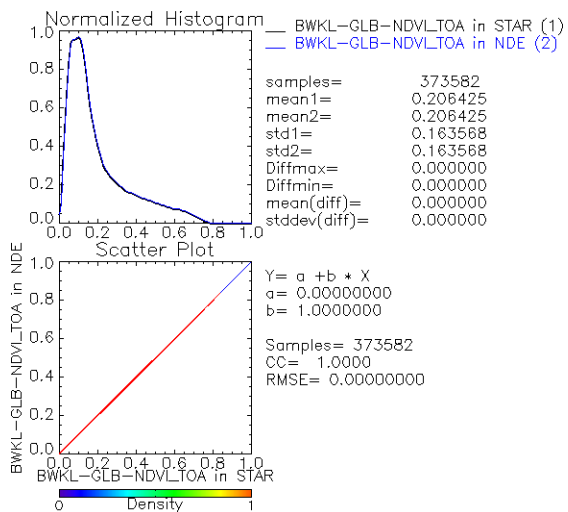
```

pro vi_compare_scatter
; using scatter plots and statistics to do batch comparing two VI products
; among multiple of date_period, spatial and temporal scales, and variables
; foreach loop on spatial scales = part or full of ['GLB', 'REG']
foreach s_scale, spatial_scales, i do begin
  ; foreach loop on dates = part or full of [20190105, 20190106]
  foreach e_date, datearr, t do begin
    ; foreach loop on temporal scales = part or full of ['DLY', 'WKL', 'BWKL']
    foreach t_scale, temporal_scales, j do begin
      ; for loop selected variables, Xname, Yname = part or full of
      ; ['EVI_TOC', 'NDVI_TOA', 'NDVI_TOC']
      for k = 0, n_elements(Xnames)-1 do begin
        compare_scatter, XinFile, YinFile, Xnames[k], Ynames[k], $
          Xtitle, Ytitle, start, count, stride, outFile
      endfor
    endforeach
  endforeach
endforeach
end

```







Accomplishments / Events:

- Developed IDL code to calculate climatology mean for administrative regions
- Tuned the 12 web pages related to administrative region averaged VH indices and percentage of drought area – added option to show VH time series with climatology mean removed
- Generated seasonal products
- Finished the first version of the revised re-compositing paper
- Routine maintenance of VH data base

Overall Status:

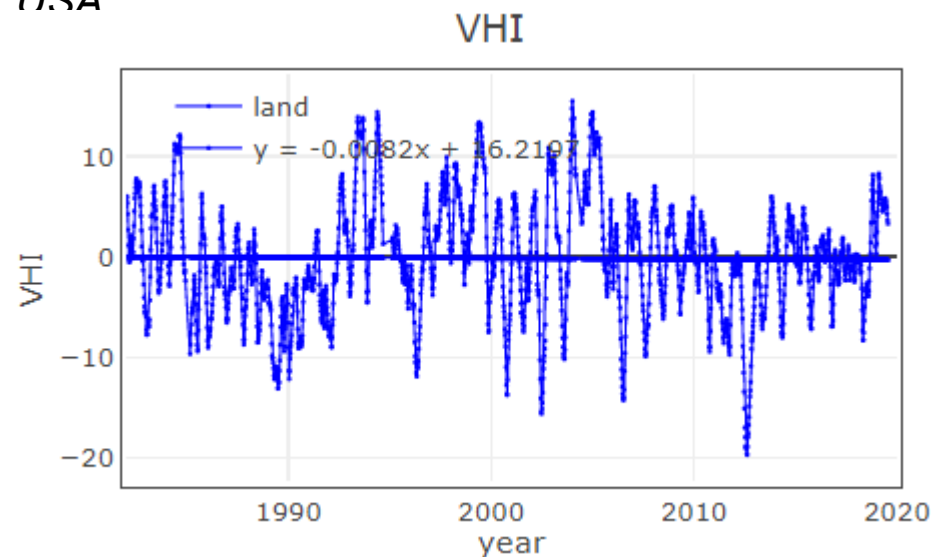
	Green ¹ (Completed)	Blue ² (On-Schedule)	Yellow ³ (Caution)	Red ⁴ (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule		X			

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: Time series of VHI anomaly over USA



Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Provisional Maturity (N20 Cal/Val)	Feb-19	Mar-19	03/21/19	Feb/Mar combined
Validated Maturity (N20 Cal/Val)	Jun-20	Jun-20	03/21/19	Review Panel recommended
S-NPP / NOAA-20 data analysis	Sep-19	Sep-19		
Cal/Val tool development (SNPP & J1 comparison)	Sep-19	Sep-19		

Accomplishments / Events:

- ❑ The 5th Annual NOAA Dedicated VIIRS Ocean Color Cal/Val cruise was a great success. *The seas and skies post-Dorian cooperated fully to provide the most effective cruise yet in terms of number of clear-sky matchups of satellite overpasses and in situ observations.*

The Ocean Color Cal/Val Science Team embarked upon the annual dedicated VIIRS Cal/Val cruise, September 7-18, 2019 aboard NOAA Ship Gordon Gunter. During the roundtrip cruise track from Newport, RI in Narragansett Bay to within lower Chesapeake Bay, the team collected water samples and deployed instrumentation at 26 stations capturing various measurements crucial to Ocean Color product quality assurance. During 24 of those stations, the team successfully collected 'matchup' measurements for both VIIRS NPP and NOAA 20 satellites. Bad weather only marred a few days of the trip and the assembled science team, representing over 14 agencies or academic research institutions, were treated to terrific weather and perfect coastal ocean color sampling conditions around features such as the Gulf Stream and high chlorophyll features at the mouths of various eastern US estuaries.

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			

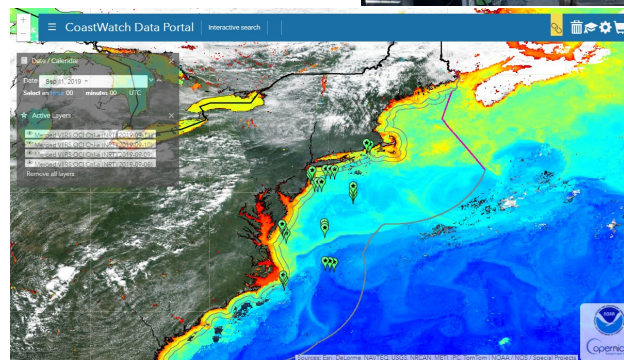
1. Project has completed.
2. Project is within budget, scope and on schedule.
3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

Big jumps in NOAA-20 SDR have impacted the schedule for validation of NOAA-20 MSL12 ocean color EDR

Highlights:

Right: Radiometry instruments deployed during a clear day on aft deck of NOAA Ship Gordon Gunter, *Cruise ID #GU-19-03*



Left: Dedicated VIIRS OC cal/val cruise station locations plotted over a MSL12 VIIRS Ocean Color composite of cruise days using the CoastWatch Data Portal.

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Beta Maturity (N20 Cal/Val)	Nov-18	Nov-18	11/27/18	
Provisional Maturity (N20 Cal/Val)	Mar-19	Mar-19	11/27/18	
Init N20 DAP to CoastWatch (data)	Feb-19	Feb-19	Feb-19	
Init N20 DAP to CoastWatch (code)	Apr-19	Apr-19	03/21/19	
Vicarious calibration for VIIRS-NOAA-20 using MOBY in situ data	Dec-18	Dec-18	Dec-18	
NOAA-20 polarization effect correction validation, evaluation, and analysis	Jun-19	Jun-19		
Cal/Val team complete the fourth VIIRS cruise report and in situ data analyses (e.g., improve in situ data quality)	Jun-19	Jun-19	May-19	Published at NOAA Library in June 2019
In situ data collections including NOAA dedicated cruise in May 2018 and continue Cal/Val for VIIRS ocean color EDR, report	Aug-19	Sep-19	9/8-16/2019	May 2019 Cruise has been postponed to September 2019 due to urgent ship repairs

Accomplishments / Events:

- NOAA web-based *in situ* Quality Monitor (*iQuam*) system serves quality-controlled *in situ* SST for the use in satellite Cal/Val
- Redesign of the *iQuam* back end is underway. Current based on IDL code and shell scripts, it cannot handle the increased data flow. As a result, the frequency of data refresh had to be changed from twice-daily to once-a-day.
- The new back end, based on using Python scripts and database, will improve the completeness and stability of *in situ* data used in satellite Cal/Val at NOAA. It will also more fully satisfy the needs of multiple national and international users of *iQuam* data.
- The ongoing development do not affect the front end and are seamless to *iQuam* users.
- All project milestones and deliverables are on schedule.

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			

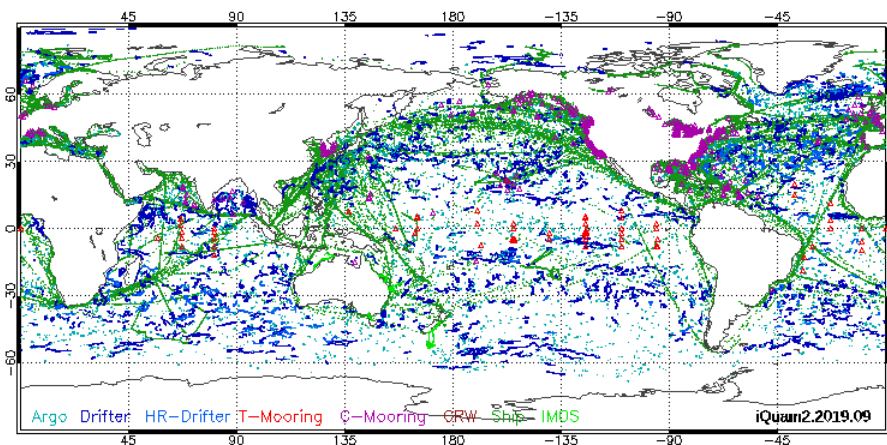
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3. Project has deviated slightly from the plan but should recover.
4. Project has fallen significantly behind schedule, and/or significantly over budget.

Issues/Risks:

None

Highlights:

www.star.nesdis.noaa.gov/sod/sst/iquam



The interface of the *iQuam* web based system. Ongoing redesign of the back end does not affect the front end and is seamless to *iQuam* users.

Milestones	Original Date	Forecast Date	Actual Completion Date
NOAA-20 Calibration/Validation			
Beta Maturity			04/18/18
Provisional Maturity			04/18/18
Validated Maturity	Apr-19	Apr-19	05/16/19
NOAA-20 Algorithm Adjustments			
Initial DAP (ACSP0 2.60)			07/05/18
Interim DAP (2.61) (update LUTs as needed)	Feb-19	Feb-19	02/12/19
ACSP0 2.70 – was not needed for N20; delivered for geo	Aug-19	May-19	05/15/2019
JPSS-2 Schedule			
J2 Cal/Val Plan - draft delivery	Jun-20	FY20	
J2 Cal/Val Plan - final delivery	Dec-20	FY21	
Planned Algorithm Updates/Cal-Val			
VIIRS RAN2 N20 archived PO.DAAC/NCEI	Jun-19	Jun-19	06/20/2019
VIIRS RAN2 NPP archived PO.DAAC/NCEI	Dec-19	FY20	On track
ACSP0 2.80 – Improved SST for data fusion	Aug-20	Aug-20	On track

Accomplishments / Events:

For 1 June - 31 August 2019, NOAA-20 polar winds were compared to radiosonde winds. The table (lower right) shows accuracies less than 6 m/s over the Arctic and less than 7 m/s over the Antarctic. Precisions are less than 3.7 m/s with mid-levels over the Antarctic being the only case where precision is above 4 m/s. The maturity requirements for JPSS wind products are 7.5 m/s for accuracy and 4.2 m/s for precision. **These results confirm and extend the validation findings of the Maturity 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			

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Issues/Risks:

None

Highlights:

	Arctic				Antarctic			
	> 700 hPa	700 to >400 hPa	<=400 hPa	Total	> 700 hPa	700 to >400 hPa	<=400 hPa	Total
Accuracy (ms ⁻¹)	5.05	5.12	5.54	5.25	5.86	6.64	6.75	6.70
Precision (ms ⁻¹)	3.67	3.51	3.73	3.67	3.56	4.31	3.28	3.68
Speed Bias (ms ⁻¹)	+0.59	+0.69	+0.51	+0.60	+0.30	-0.96	-0.92	-0.92
NRMSE (ms ⁻¹)	0.65	0.41	0.32	0.41	0.62	0.57	0.39	0.44
Mean AMV Speed (ms ⁻¹)	10.28	15.76	21.67	16.36	11.40	13.01	18.51	16.51
Sample Size	6104	9048	8019	23171	17	546	1004	1567

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Beta/Provisional Maturity			10/02/18	
Validated Maturity (N20 Cal/Val)	May-19	May-19	05/16/19	
Final DAP (N20 Algorithm Adjustment)	Mar-19	Mar-19	03/11/19	
Introduce and evaluate a parallax correction in the winds algorithm (it is needed for the mixed-satellite product)	Sep-19	Sep-19	09/30/19	
Finalize development and begin routine processing of combined (mixed-satellite) S-NPP/NOAA-20 global winds	Sep-19	Sep-19	09/01/19	
Implementation of the shortwave IR (2.25 μm) band winds	Sep-19	Sep-19	Dec-18 (routine generation of research product)	

Accomplishments / Events

- We have acquired CAMS profiles to compute an improved SARTA bias correction.
- Work continued on the validation of NUCAPS CO, CH4 and CO2 by the use of innovative AirCore *in situ* data in collaboration with NOAA/ESRL.
- Code has been integrated as V2.5.2 – A candidate version for S-NPP/NUCAPS Maturity Review.
- Delivered V2.5.2.1 as the operational version for parallel runs in the ASSISTT framework to produce a week to 10 days of S-NPP/NOAA-20 and OLR results to assist comparisons with the NPROVS in preparation for the validated maturity review.
- V2.5.2.2 demonstrates improvement to the temperature, moisture, and ozone profile products, especially for NOAA-20, and that these products are meeting JPSS requirements.
- Successful presentation by Nalli et al. titled “NOAA-20 and SNPP NUCAPS Validation Updates” at the NASA Sounder Science Team Meeting held September 25-27, 2019 demonstrated product improvements with respect to JPSS requirements.

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			

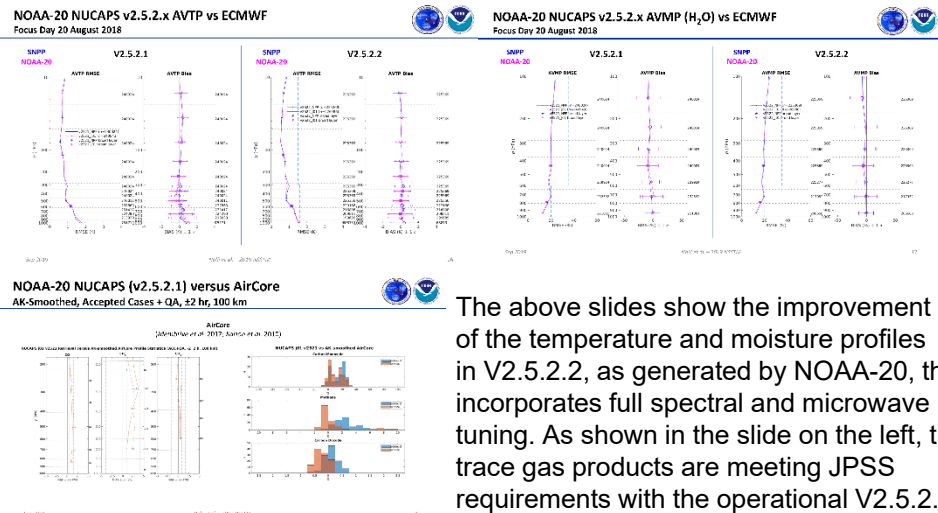
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Issues/Risks:

Metop C NUCAPS delivery has been postponed to FY2020, TBD.

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Provisional Maturity: Ozone, CO, OLR			10/02/18	
N20 Provisional Maturity: CH4	Apr-19	Oct-19		VPN was slow during shutdown; sources of error (forward model, upstream retrieval steps) need more investigation
SNPP & N20 Validated Maturity: CO	Sep-19	Oct-19		Same as above
Validated Maturity: S-NPP & N20 CH4	Sep-19	Feb-20		Same as above
Validated Maturity: SNPP- N20 CO2	Apr-19	Dec-20		Same as above
DAP (N20 Algorithm Adjustment)	Apr-19	Oct-19	Sep-19	Same as above
DAP (N20 Algorithm Adjustment)	Apr-19	Mar-20		Same as above
DAP (N20 Algorithm Adjustment)	Apr-19	Dec-20		Same as above
Generate regression coefficients (OLR)	Apr-19	SEP-19	Aug-19	
Validation with NPP CERES radiation products (OLR)	Sep-19	Sep-19	Aug-19	
Improve NOAA-20 CO, CH4 and CO2 retrieval algorithm	Dec-18	Dec-18		
Validation against NUCAPS SNPP trace gas EDRs, other instruments (MOPITT, AIRS, IASI) and in situ measurements (TCCON, ATom, WE-CAN, KORUS)	Sep-19	Sep-19	Sep-19	Completed with AirCore and TCCON
Optimize NOAA-20 AVMP/AVTP/O3 retrieval algorithm	Dec-18	Dec-18	Sep-19	
Validation against model data and radiosondes; SNPP and J1 EDRs cross comparisons	Sep-19	Sep-19	Sep-19	Completed with ECMWF model

Highlights Selected slides from Nalli et al. presentation:



The above slides show the improvement of the temperature and moisture profiles in v2.5.2.2, as generated by NOAA-20, that incorporates full spectral and microwave tuning. As shown in the slide on the left, the trace gas products are meeting JPSS requirements with the operational v2.5.2.1.

Accomplishments / Events:

- Major milestone reached with completion of N20 Validated Maturity Review on September 19th. All official EDRs were validated with performance results showing that JPSS requirements are being met for all EDRs under global conditions and in all seasons. See highlights for review summary.
- Initial discussions held on preparations for JPSS-2 and requirements of the algorithm teams for geophysically realistic sample data prior to any algorithm software deliveries.

Overall Status:

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

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Issues/Risks:

None

Highlights:

MiRS N20 Validated Maturity Review results summary:

- Temperature, Water Vapor, TPW, LST, LSE, Sea Ice Concentration, Snow Cover, SWE, Rain Rate, and CLW have been validated using in situ observations, independent satellite products, and global forecast model analyses.
- Performance has been evaluated in STAR over more than one annual cycle, globally, over land and ocean, and in clear, cloudy, and rainy conditions.
- EDRs generally meet all requirements for accuracy, precision and categorical scores (with a few exceptions).
- Performance highly consistent with SNPP validation results for same time periods.

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Validated Maturity (N20 Cal/Val)	Sep-19	Sep-19	09/19/19	
Final DAP (N20 Algorithm Adjustment)	Mar-19	Mar-19	Mar-19	
Bias correction for NOAA-20	Mar-19	Mar-19	Mar-19	
Validation against ECMWF data and radiosondes	Sep-19	Sep-19	Sep-19	
Validation against other reference data for other EDRs	Sep-19	Sep-19	Sep-19	

Accomplishments / Events:

- Both NOAA-20 and S-NPP SFR have been recalibrated using the NCEP hourly Stage IV radar and gauge combined precipitation analysis. The Stage IV data from the Colorado Basin River Forecast Center (CBRFC) and Missouri Basin River Forecast Center (MBRFC) have been removed from the validation dataset due to potential data quality issues. Validation study was also conducted with the following results:

	Corr Coeff	Bias (mm/hr)	RMS (mm/hr)
NOAA-20	0.67	-0.07	0.56
S-NPP	0.67	-0.09	0.56

- The recalibration of MHS SFR is underway for four satellites: NOAA-19, NOAA-19, Metop-A, and Metop-B. Four MHS and Stage IV collocated datasets have been constructed. The recalibration will follow the newly developed approach as used for ATMS SFR.

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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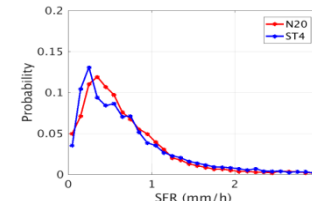
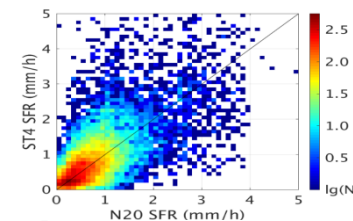
Issues/Risks:

None

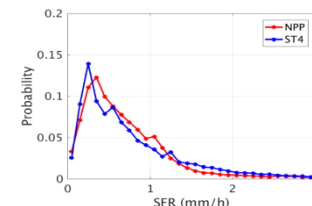
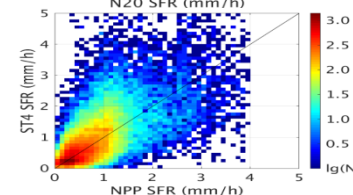
Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Validated Maturity: NOAA-20 and S-NPP SFR	Jun-20	Jun-20	05/16/201	
Provisional Maturity: NOAA-20 SFR	Mar-19	May-19	05/16/19	
Final DAP (N20 SFR)	Mar-19	Mar-19	Mar-19	
Update radiometric bias correction coefficients	Dec-18	Dec-18	Dec-18	
Deliver updated SFR package to MiRS team (for Mar-19 DAP delivery)	Feb-19	Feb-19	Feb-19	

Highlights:

NOAA-20



S-NPP



Validation result against Stage IV, (top left: Stage IV vs. NOAA-20 scatter plot, (top right): NOAA-20 SFR and Stage IV probability distribution functions, (bottom left): Stage IV vs. S-NPP SFR scatter plot, (bottom right): S-NPP SFR and Stage IV probability distribution functions.

Accomplishments / Events:

- Preparing Provisional Briefing for S-NPP V8Pro and Validated Briefing for V8TOz EDRs.
- Provided DAP with new V8Pro code delivery for NDE with significant updates – Outlier filtering, consistency with SBUV/2 for reflectivity and averaging kernels, dual adjustment tables for smooth soft calibration changes and area weighted matchup nadir mapper FOVs.
- ORR in preparation for V2Limb at NDE I&T. Height error found and Delta DAP in preparation.

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
Provisional Maturity: V8TOz			10/03/18	
Provisional Maturity: V8Pro	Feb-19	Sep-19	09/20/19	SDR
Validated Maturity: V8TOz	Mar-19	Sep-19	09/20/19	SDR
Validated Maturity: V8Pro	Apr-19	Dec-19		V8Pro Code
N20 Final DAP: V8Pro	Apr-19	Sep-19	09/04/19	To ASSISTT
Trending of ground-based comparisons	Mar-19	Aug-19		
Algorithm improvements (solar, Wavelengths, bandpasses)	Sep-19	May-20		Other V8Pro corrections
RT Tables for NOAA-20	Sep-19	Aug-19		If needed

Overall Status:

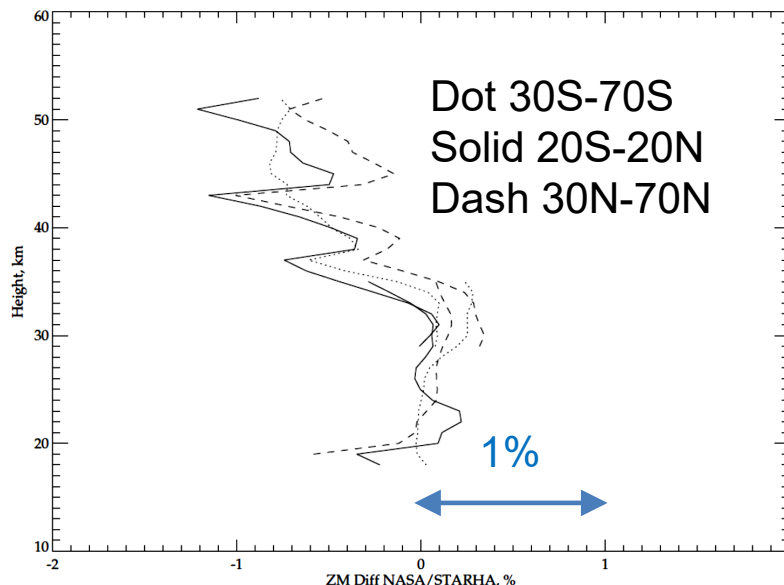
	Green ¹ (Completed)	Blue ² (On-Schedule)	Yellow ³ (Caution)	Red ⁴ (Critical)	Reason for Deviation
Cost / Budget		X			
Technical / Programmatic		X			
Schedule			X		# SDR Schedule, code change

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 Changes for OMPS V8Pro EDR on path to maturity will not be implemented at NDE until Dec 2019. Adjustments for SDR changes TBD.

OMPS Limb Profile Zonal Mean Retrieval Differences, NASA versus STAR for August 10, 2019



Accomplishments / Events:

- Activities continue with NESDIS IA and JPSS to discuss AMSR3 and AMSR2 progress/plans
- Engaging JPSS Program Office on budget needs/planning for AMSR-3
- Continued product cal/val; all products meeting requirements
- Updated GAASP package became operational on 9/17/19
- Reprocessing taking longer than anticipated; should be completed by October 2019.
- Several STAR GCOM EDR's being reported on at the Joint Satellite Conference (Boston, MA, week of Oct. 1)

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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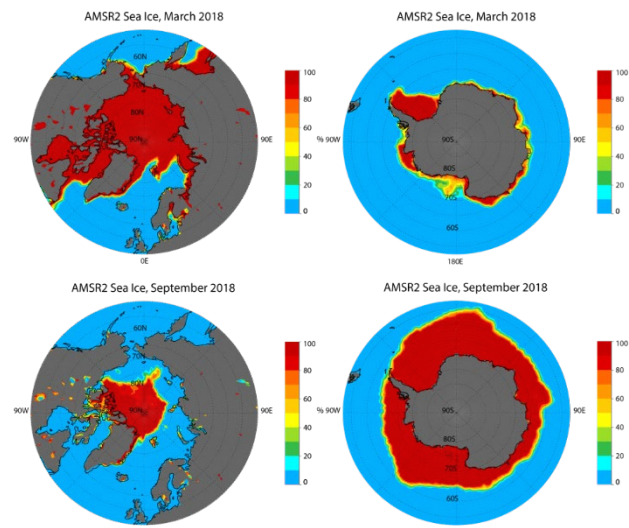
Issues/Risks:

None

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
GAASP emergency update DAP (fixed some typo's in the Longitude metadata in 4 of the netCDF template files)			02/11/19	
GAASP_v2-5 DAP (update to the Ocean SSW algorithm and the Precipitation algorithm, with some other minor updates)			To NDE: 03/19/19 To CSPP: 03/20/19	
Deliver updated TPW algorithm for integration into GAASP	Dec-18	Dec-18	Dec-18*	*Validation results did not warrant an update
Deliver updated CLW algorithm for integration into GAASP	Apr-19	Apr-19	Apr-19*	*As stated above
Deliver updated rain rate algorithm for integration into GAASP	Apr-19	Apr-19	Apr-19	
Updated GAASP package delivered to NDE/OSPO	Jul-19	Jul-19	Aug-19	Bug fix for wind flag
Reprocessing of AMSR-2 mission	Sep-19	Oct-19		Processing taking longer

Highlights: Exploitation of reprocessed GCOM EDR's

Monthly mean sea-ice concentration near times of min/max coverage



Accomplishments / Events:

- Supported re-configuration of NUCAPS parallel test system to assess NPP and NOAA-20 20 v 2.5.2.1 using NPROVS.
- Received funding (\$50K) for expanding NPROVS in preparation for COSMIC-2 and commercial Radios Occultation; Bomin Sun attended International Radio Occultation Working Group (IROWG) in Denmark.
- Observations from the ongoing Radiosonde Inter-comparison and VALidation (RIVAL) campaign stewarded (NPROVS Special)
- FY19 funds for JPSS dedicated radiosonde program received and radiosondes purchased alleviating ARM field shortage (**Highlight**)
- AEROSE radiosonde funding received and Beltsville re-imbursed.
- Attended and presented at AIRS Science team meeting; Univ. Md., College Park
- The EDR LTM team added CPC MORPHing Technique (CMORPH) precipitation product to JSTAR mapper (**Highlight**)

Overall Status:

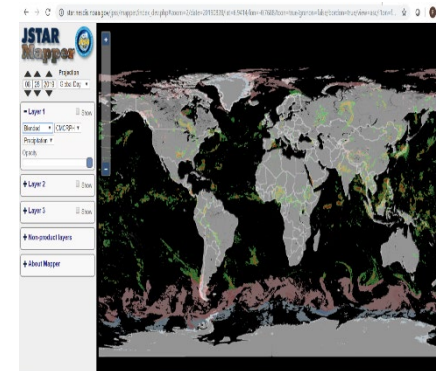
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Technical / Programmatic		X			
Schedule		X			

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Issues/Risks:

None

Highlights:



NPROVS: After several months of delay, funding for the JPSS /DOE-ARM dedicated radiosonde program was restored. These data directly support ongoing NOAA satellite Cal / Val activities for sensors and products

LTM: Screen capture of the JSTAR Mapper site showing the 23:30Z CMORPH image on August 28, 2019

Milestones	Original Date	Forecast Date	Actual Completion Date	Variance Explanation
LTM				
Complete NOAA-20 JMAPPER/EDR-LTM	Sep-19	Sep-19		
NPROVS				
Maintain NPROVS and support R2O transition of NOAA-20 and NUCAPS upgrades to correct identified problems for IR+MW and MW sounding	Jan-19	Jan-19	March - 19	Shutdown; upgrades pending
Maintain JPSS dedicated radiosonde program including AEROSE and RIVAL observations stored in NPROVS Special	Mar-19	March-19		Program Extended
Support NWS Raob Transition Monitoring and NUCAPS AWIPS-2 users	Sept-19	Sept -19		