



ICVS SDR/EDR REPORT

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NOAA/STAR

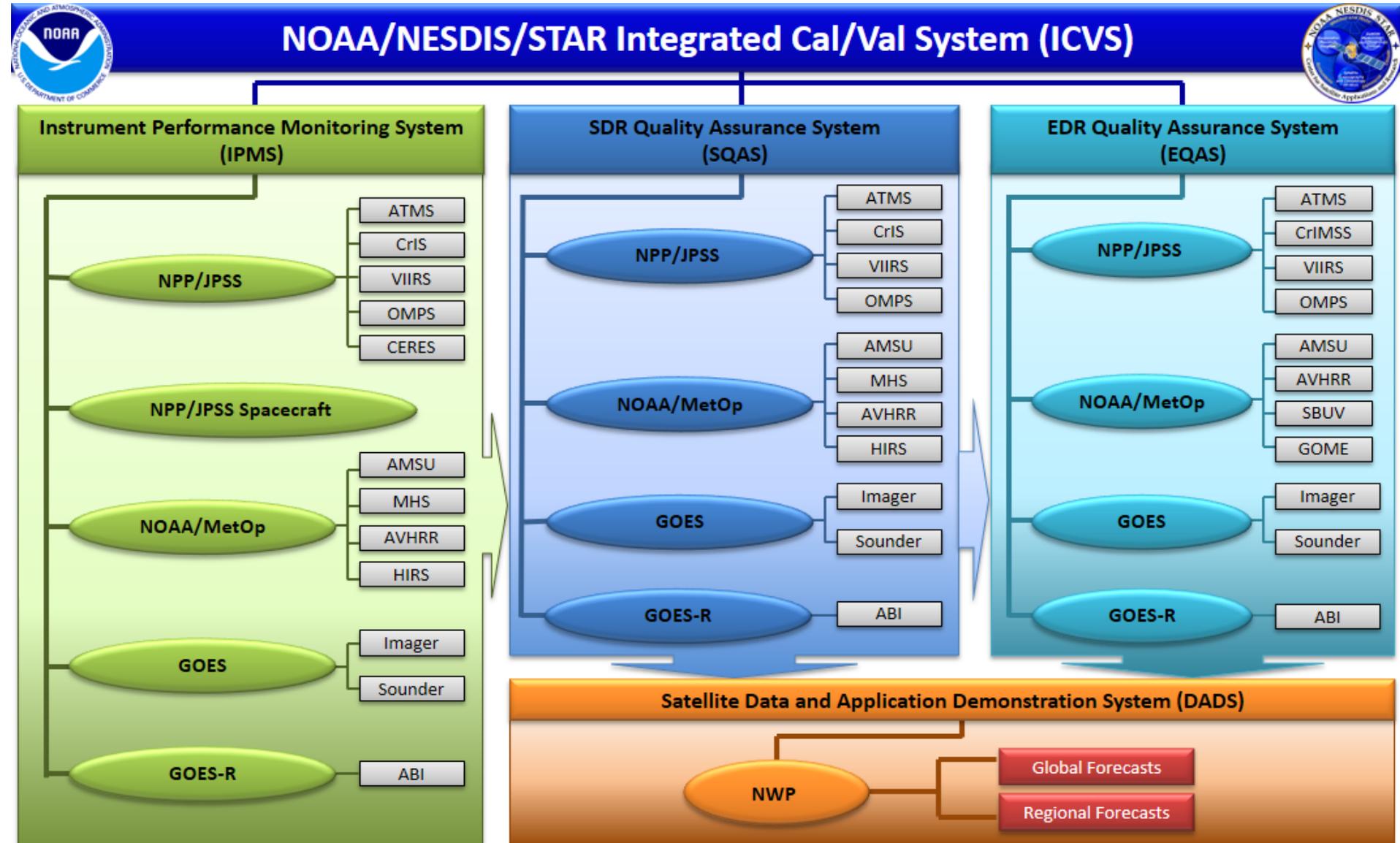
Outline

- ICVS Team Members
- ICVS System Overview
- ICVS Product Overview
- JPSS-1 Readiness
- Summary and Path Forward

ICVS SDR Team Members

Team Member	Organization	Roles and Responsibilities
Fuzhong Weng	NOAA/STAR	ICVS Lead: Budget and execution, strategic science direction, and oversight the ICVS team Cal/Val tasks, reprocessing
Ninghai Sun	NOAA/STAR	ICVS technical lead for system development, science coordination, research to operation transition, ATMS instrument status/performance and TDR/SDR quality monitoring, spacecraft health status monitoring
Jason Choi	ERT	VIIRS instrument status and performance monitoring and trending
Xin Jin Miao Tian Stanislav Kireev	ERT	CrIS instrument status and SDR quality monitoring and trending
Ding Liang	ERT	OMPS instrument status and performance monitoring and trending
Wanchun Chen	ERT	System integration, testing, and R2O transition. Suomi NPP SDR reprocessing
Pedro Vicente	ERT	System integration, optimization, and testing.
Lori Brown	NOAA/STAR	ICVS website development

ICVS System Overview



ICVS Product Overview

- NOAA ICVS provides the following services
 - Monitors over 400 parameters for 28 instruments onboard NOAA/METOP/SNPP satellites
 - Monitors and trends the SNPP spacecraft parameters , supporting NASA flight team
 - Monitors the instrument performance through trending the instrument house-keeping and telemetry parameters
 - Detects the anomaly events and automatically sends the warning messages to NOAA satellite operators, NASA instrument scientists, and senior program managers
 - Characterizes the sounder SDR data quality with respect to the numerical weather prediction model (NWP) simulations
 - Provides NWP users and remote sensing communities on the instrument noises for their real-time applications (e.g. error covariance in data assimilation)
 - Generates high resolution geostationary/polar-orbiting satellite images
 - 4246 all instrument status and data quality trending figures generated in near real time
 - Supports Suomi NPP life cycle reprocessing by operating SDR processing packages

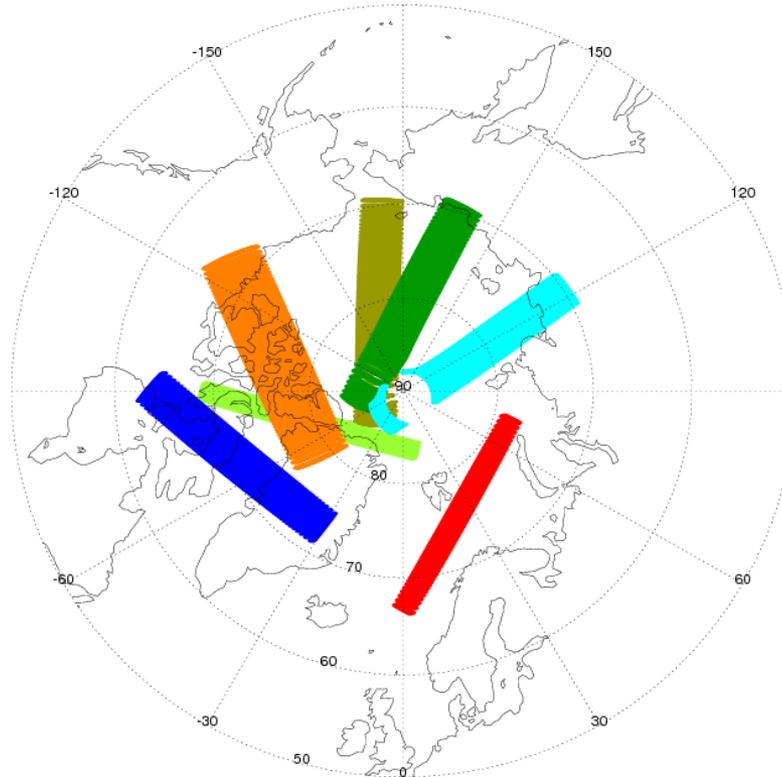
ICVS Product Overview

S-NPP ATMS Scan Reversal Missing Granule Map

2016-07-25 Total Number of Reversal Events: 7

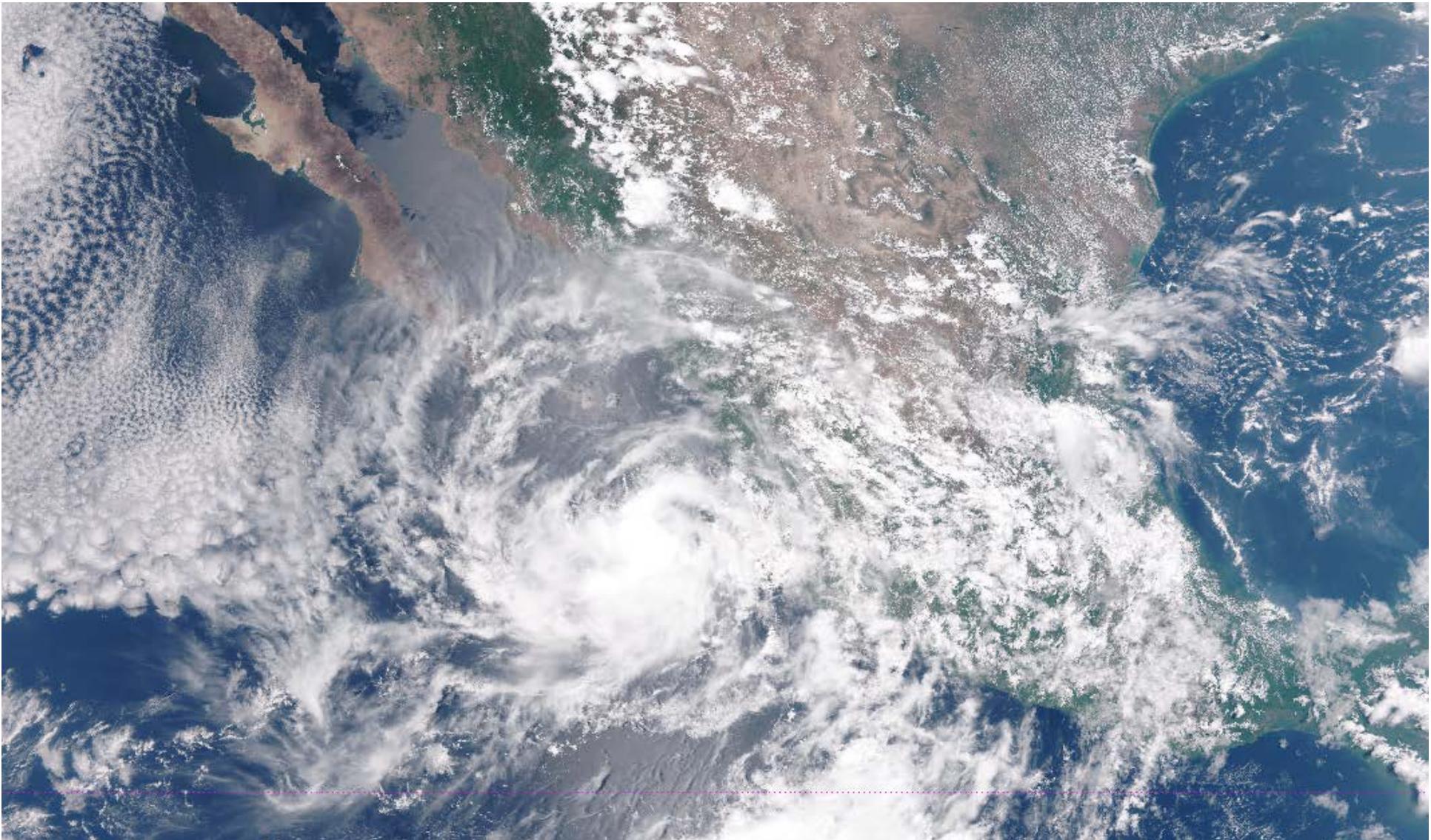


NOAA/NESDIS/STAR

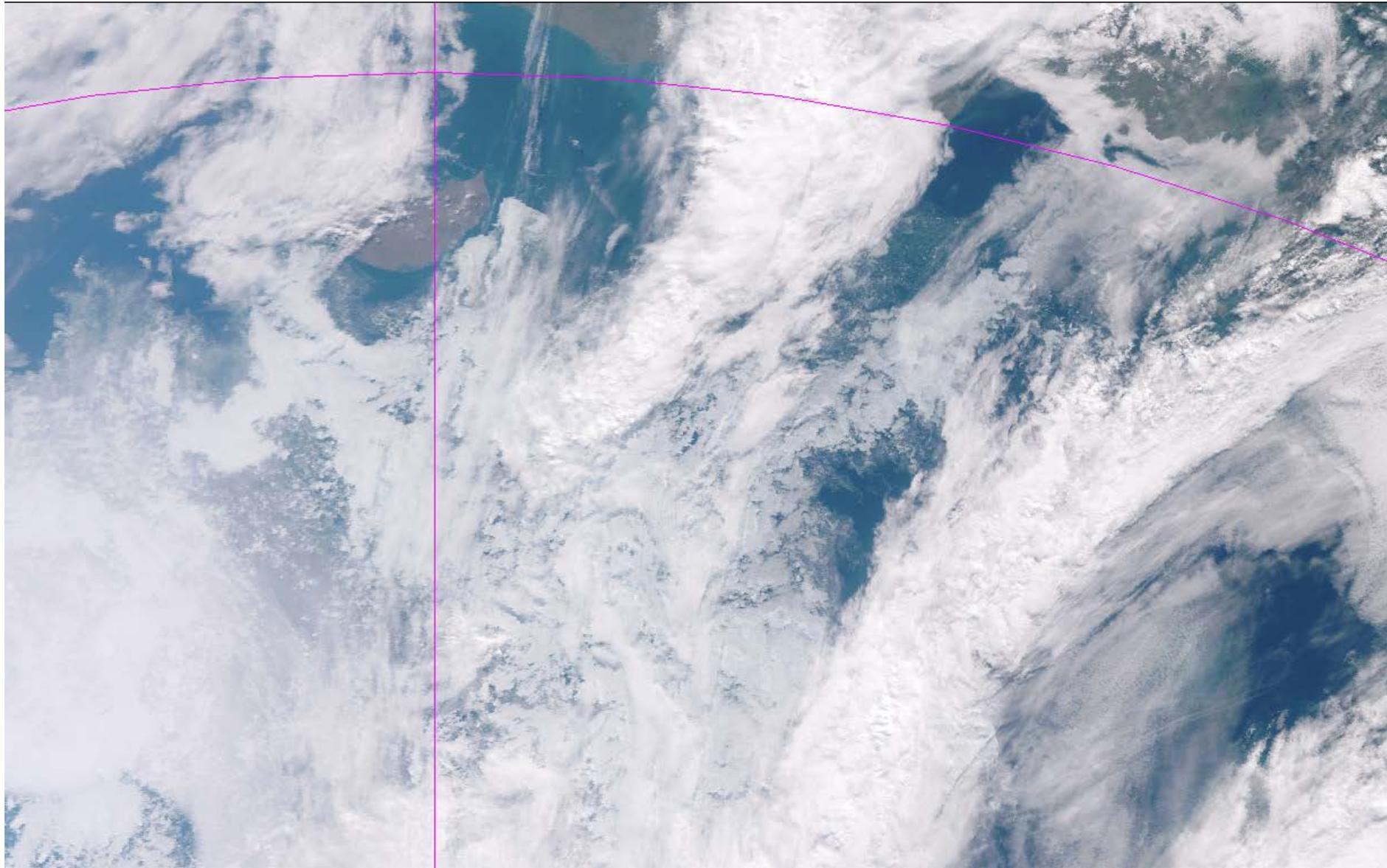


- | | |
|---|--|
| ■ B24573 09:26:08~09:26:24 UTC | ■ B24576 14:32:10~14:32:26 UTC |
| ■ B24577 16:10:45~16:11:01 UTC | ■ B24578 17:53:53~17:54:09 UTC |
| ■ B24579 19:37:26~19:37:43 UTC | ■ B24580 21:18:45~21:19:01 UTC |
| ■ B24581 23:01:53~23:02:09 UTC | |

ICVS Product Overview



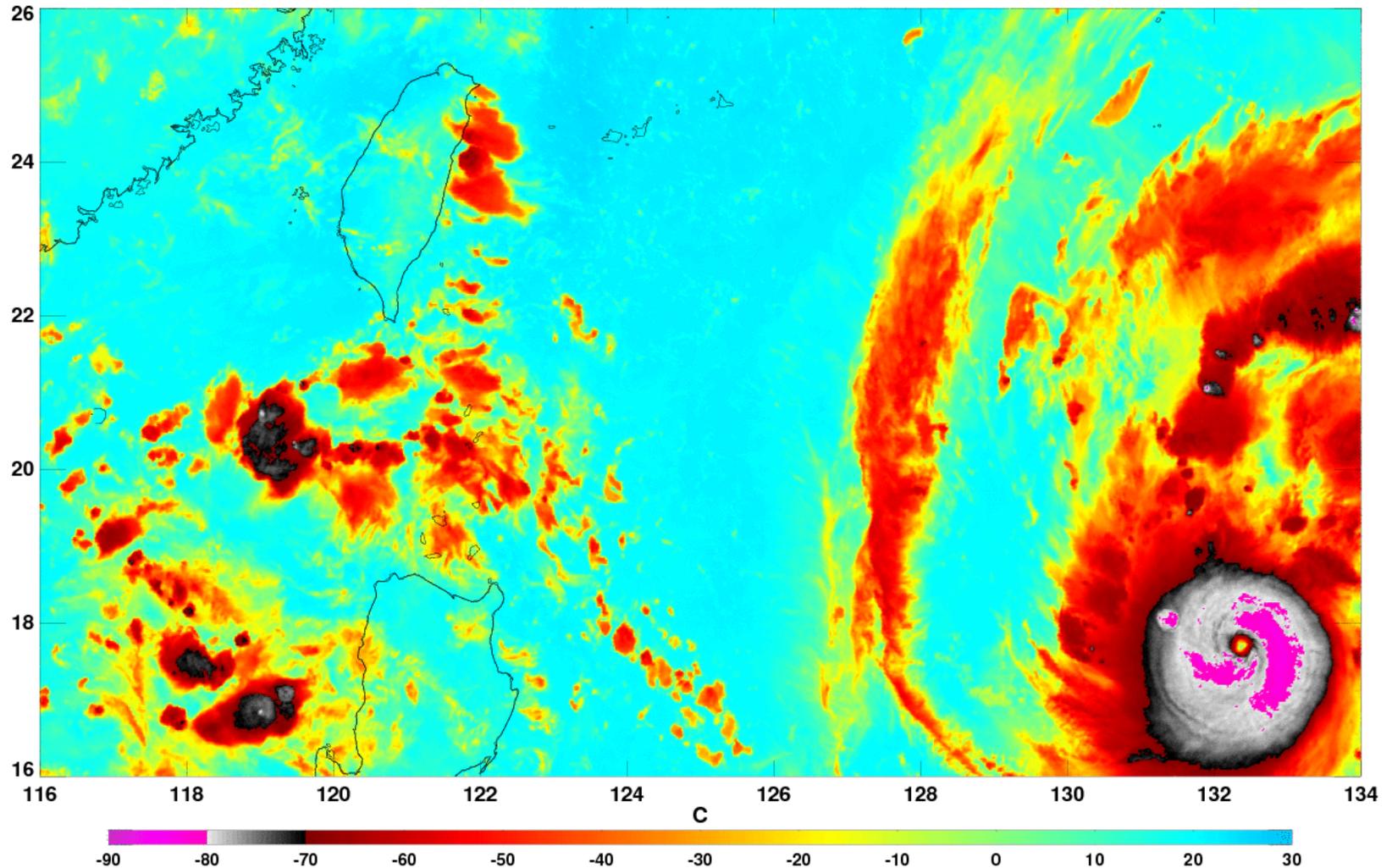
ICVS Product Overview



ICVS Product Overview

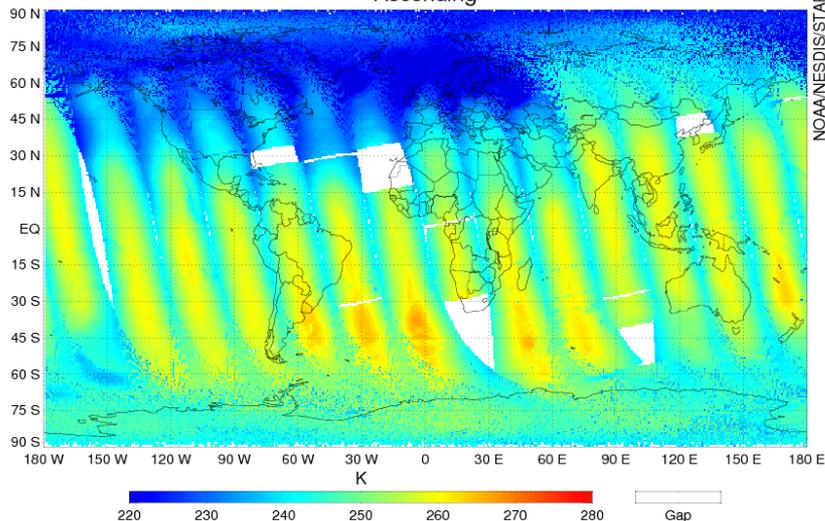
Super typhoon Nepartak from July 5 to 8, 2016 UTC

Himawari-8 AHI TB, 2016-07-05 16:00 UTC, Band B13 (10.4 um)

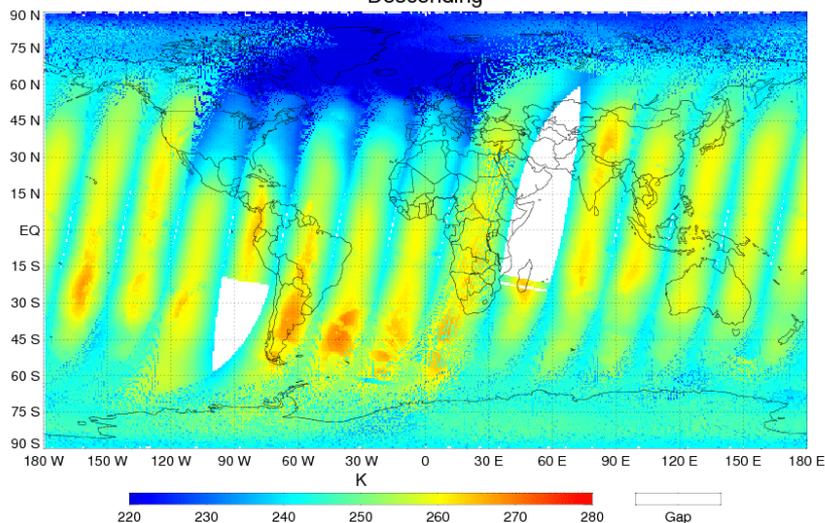


JPSS-1 Readiness

JPSS-1 ATMS TDR Ch.6 53.596±0.115 GHz QH-POL
2016-04-09
Ascending



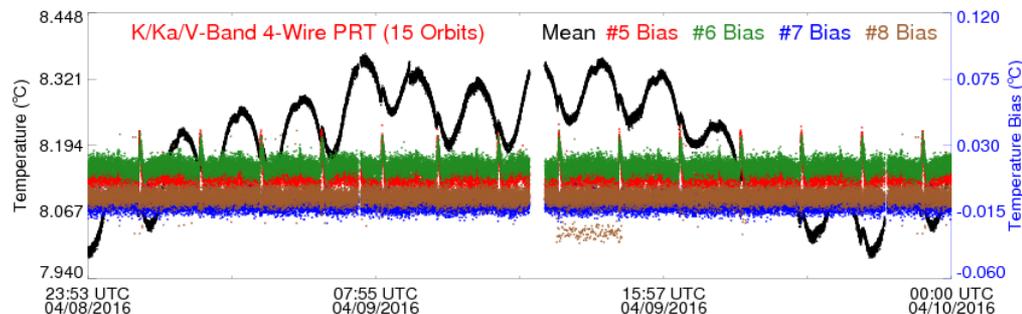
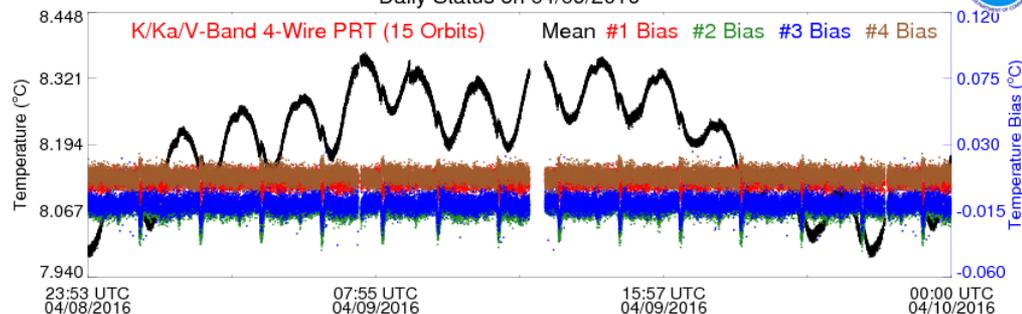
Descending



- LG2 data have been successfully tested by ICVS modules
- Sample images have been pushed to ICVS-beta website for seamless transition testing
- Spacecraft TVAC data will be used for additional JPSS-1 readiness testing

JPSS-1 ATMS K/Ka/V-Band 4-Wire PRT Temperature

Daily Status on 04/09/2016



Summary & Path Forward

- Summary

- ICVS keeps providing S-NPP spacecraft and aboard instrument health status and performance near real time monitoring
- ICVS keeps supporting S-NPP SDR calibration/validation and EDR product generation tasks
- ICVS has been upgraded and ready for JPSS-1 near real time monitoring
- ICVS extends its capability to cover more user requested products to better
- STAR ICVS for JPSS has been successfully transitioned to GRAVITE for 24/7 real time operations

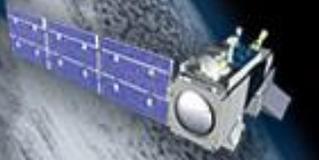
- Path Forward

- Support S-NPP life cycle SDR reprocessing
- Provide more geostationary high resolution image products to support severe weather event monitoring



ICVS & JPSS/EDRs Long-Term Monitoring Systems

Website Status,
J-1 Readiness
& New Features



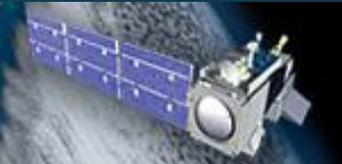
System Status and J-1 Readiness

ICVS & JPSS/EDRs Long Term Monitoring Systems

Lori K. Brown

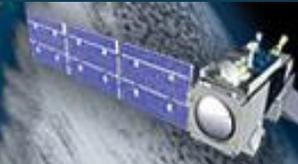
StormCenter Communications at NESDIS / STAR

2016 STAR JPSS Annual Science Meeting
Session 2 - 8 August 2016



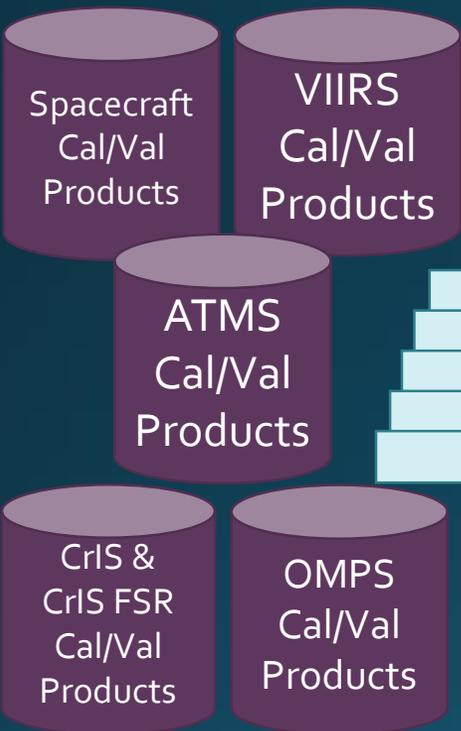
What is the Long Term Monitoring System?

- A web application built with HTML, CSS, javascript/jquery, and PHP designed to organize, navigate and display a large set of images, cal-val metrics, and data produced daily and accumulated over the life of the S-NPP satellite
 - Originally developed for ICVS project
 - Went live in September 2013
 - Effort to extend and implement the LTM application for product monitoring (EDRs) started in fall 2014
- Designed to be 'content agnostic' so as to flexibly house any image, text, or data file, as long as content files conform to the system's naming and organization conventions
- ICVS: <http://www.star.nesdis.noaa.gov/icvs/>
- JPSS EDRs: <http://www.star.nesdis.noaa.gov/jpss/EDRs/>



ICVS LTM – Web Interface Architecture

S-NPP Cal/Val products

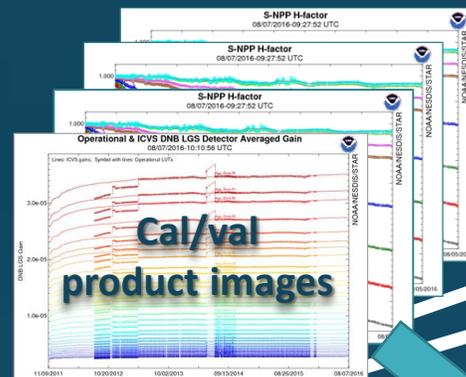


ICVS instrument teams develop code to generate S-NPP cal/val metrics; code runs several times per day on STAR servers.

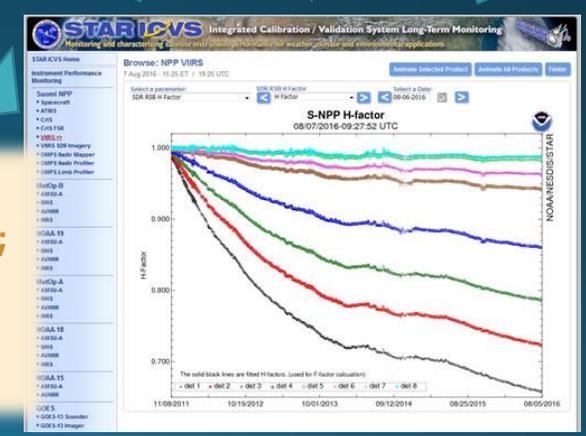
Products generated & copied to webserver several times daily

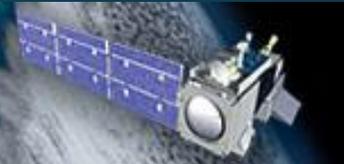


Product images organized by instrument, type, year & month. All images created to a common naming convention that makes the page coding and dynamic scripting portable and extensible across all instances of the LTM codebase



The ICVS and EDR instances of the LTM System run on an IDENTICAL codebase; this focuses development efforts on extending and improving functionality instead of managing code.





Scale of JPSS monitoring effort - by the numbers

ICVS – LTM System



Images generated per day



Total site users — last 12 months



of team contributors



Web pages

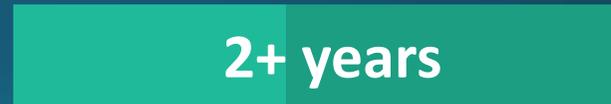
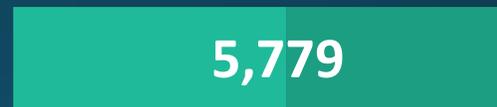


Time span monitored



Total images generated / file size

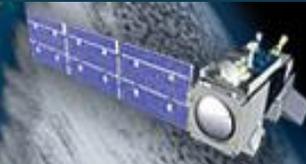
JPSS EDRs LTM Site





ICVS & JPSS/EDRs Long-Term Monitoring Systems

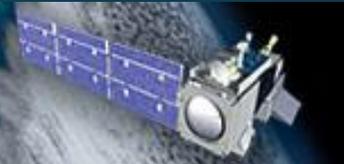
Website Status,
J-I Readiness
& New Features



ICVS Cal / Val Metrics Generated Daily:

Satellite Instrument	# metrics	Generated starting:	Satellite Instrument	# metrics	Generated starting:
Suomi NPP 2896			NOAA-19 433		
Spacecraft	109	3/25/2013	AMSU-A	179	5/20/2013
ATMS	447	7/26/2013	MHS	65	6/10/2013
CrIS	452	1/30/2012	AVHRR	63	8/1/2013
CrIS FSR	261	12/4/2014	HIRS	126	7/2/2013
VIIRS	353	5/16/2013	MetOp-A 408		
VIIRS SDR Imagery	721	June 2016	AMSU-A	153	10/6/2012
OMPS Nadir Mapper	224	November 2011	MHS	65	5/21/2013
OMPS Nadir Profiler	167	November 2011	AVHRR	64	8/1/2013
OMPS Limb Profiler	162	October 2012	HIRS	126	7/9/2013
MetOp-B 434			NOAA-18 435		
AMSU-A	179	5/16/2013	AMSU-A	181	5/20/2013
MHS	65	5/22/2013	MHS	65	5/21/2013
AVHRR	64	8/1/2013	AVHRR	63	8/1/2013
HIRS	126	7/4/2013	HIRS	126	7/5/2013
Total across all satellite/instruments monitored: 4,818 images per day			NOAA-15 212		
			AMSU-A	149	3/24/2015
			AVHRR	63	2/10/2016

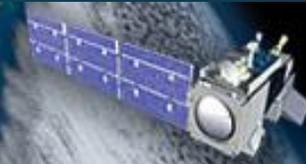
- The set of metrics generated for each satellite/instrument pair is managed in a CSV file that is maintained by each instrument team; the CSV file is the source for the dynamically generated set of select boxes on each status page.
- Teams can make changes to reconfigure the images shown on each page independently, without any programming or scripting. This way the site can instantly reflect any changes to the set of generated metrics.
- The dates at left are the date that each instruments metrics start.



All JPSS EDR Products now generated daily – Completion of Phase I

Products	# Daily Products	Start	Products	# Daily Products	Start
Active Fires	1	1/1/2012	Ocean Color	3	1/1/2015
Active Fires - radiative power	3	3/16/2016	OMPS / Ozone	3	1/1/2015
Aerosols - AOT	1	1/1/2013	OMPS / IMOPO	2	12/18/2015
Aerosols - Suspended Matter	1	1/1/2015	Polar Winds	2	7/20/2016
Albedo	1	1/1/2015	Sea Surface Temperature	2	12/7/2015
Clouds	4	1/1/2015	Surface Type	4	5/1/2015
Cryosphere - Ice	4	2/5/2016	Green Vegetation Fraction	1	8/1/2012
Cryosphere - Snow	15	1/1/2015	Vegetation Indices	3	5/19/2014
GCOM - AMSR2	40	1/1/2016	Veg. Health - weekly composites	6	1/1/2015
VIIRS Imagery - DNB	1	4/23/2016	MIRS Soundings Products	166	2/18/2016
Land Surface Temperature	4	4/7/2014	NUCAPS	584	1/1/2015

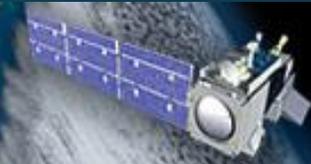
- The goal of this phase was to offer a global overview for users and downstream products to quickly assess availability and potential sources of error.
- This phase also allowed for the creation of a framework and a common set of presentation standards for all EDR teams to use.



Phase II – JPSS/EDRs LTM

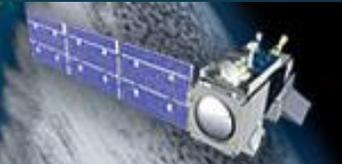
- Starting: August 2016
 - Will focus on showing real time measures of product quality, such as maps of quality flags or percentage of the granules in a day that meet the specifications.
 - Comparisons to similar products from other satellite systems will be included.
 - The site will also show trending of these and other measures of product quality.
 - The full system will be in place for the Spring 2017 launch of JPSS-1 and will enable product developers and users to quickly identify and rectify potential errors in EDR products.
- **JPSS-1 readiness:**
 - The EDR LTM Phase I is ready to replicate and stand up for JPSS-1
 - Phase II will be complete by launch of JPSS-1.





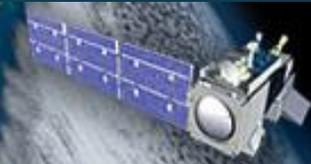
Recent LTM System Improvements – available to both ICVS and JPSS-EDR product sites

- New since May 2015:
 - Users can animate any product across a user configured time span. (demo)
 - Pages with a large number of different products (all ICVS pages and the Soundings pages for EDRs) have in-page search – click ‘Finder’ button to search by product name instead of select box navigation.
 - Status pages include a configurable description popup. (demo in EDRs)
 - Performance rework in Feb. 2016 to ship code to GRAVITE included complete review of page loading performance to reduce server trips, simplify javascript and php includes.



ICVS LTM System Status & JPSS-1 Readiness

- Addition of VIIRS high resolution SDR imagery page:
 - http://star.nesdis.noaa.gov/icvs/status_NPP_VIIRS_IMG.php
- Incorporated weekly updated Anomaly History for JPSS:
 - <http://star.nesdis.noaa.gov/icvs/AnomalyHistory.php>
 - Sortable, searchable, and includes a current downloadable bundle of change lists.
- **JPSS-1 readiness:**
 - The beta site for ICVS has had pages for all the JPSS-1 instruments live since Feb. 2016
 - Full set of J-1 images for test dates April 9, 2016
 - http://star.nesdis.noaa.gov/icvs-beta/status_J01_sc.php



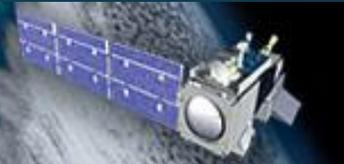
Coming Attractions!

- Enlargements for selected images (VIIRS-DNB first)
- Sharable URLs for specified images
- Vector-based charting
- User configurable comparisons between instruments, between products, etc.
- GOES-R Cal-Val site
- ICVS is a MONITORING tool, but as it matures, users look for features that trend towards making it an ANALYSIS tool.



ICVS & JPSS/EDRs
Long-Term Monitoring Systems

Website Status,
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THANK YOU ALL!

ICVS: Ninghai Sun, Pedro Vicente, Xin Jin, Jason Choi, Ding Liang, Xingming Liang, Shubha Barriga, Haifeng Qian, Stanislav Kireev, Jianfu Pan, Wanchun Chen (aka Tom Hanks), Miao Tian, Lori Brown, Fuzhong Weng, Ken Carey.....**JPSS EDRs:** Curtis Seaman, Denis Botembakov, Peter Romanov, Yinghui Liu, Lide Jiang, Karlis Mikelsons, Pubu Ciren, Jingfeng Huang, Yuan Zhou, Peng Yu, Flavio Iturbide-Sanchez, Rui Zhang, Ralph Ferraro, Zhangyan Jiang, Chris Grassotti, Felix Kogan, Wei Guo, Bob Yu, Sasha Ignatov, Veronica Lance, Shuyan Liu, Ivan Csiszar, Marina Tsidulko, Don Hillger, Tony Reale, Larry Flynn, Marco Vargas, Eric Beach, Paul Chang, Qi Zhou, Jerry Zhan, Jeff Key, Menghua Wang, Shobha Kondragunta, Istvan Laszlo, Mark Liu, Andy Heidinger.....