

TOWR-S Update

September 29, 2023

<https://meet.google.com/thn-pkwe-wbr>

Best viewed in
Google Slides.
All are invited to
insert comments.



Office of Observations | GOES-R Program
TOWR-S Team

Total Operational Weather Readiness - Satellites



Overview



1. [TOWR-S resources and activities](#)
2. [New / upcoming satellite data products](#)
3. [NOAA-21 Transition to Operations](#)
4. [Recent and upcoming satellite launches](#)

[Appendix](#)

1. New and upcoming TOWR-S resources



Coming soon: TOWR-S RPM v24



Target release: November 2, 2023

Support for new products in AWIPS:

- New GOES-R Cloud Cover Layers ([quick guide](#))
- Sectors and basemap for GOES-R Storage slot (105°W)
- Updates GOES-14 NH/NA/US menus (for contingency)
- NESDIS Blended Snowfall Rate (LDM via SPoRT) (Conus)
- **Upcoming GOES-R L2 products:** Enterprise Aerosol Optical Depth, Aerosol Detection, Ice Motion

AWIPS configuration changes:

- GOES-R Enterprise Cloud Particle Size ("~~PSD~~"→"CPS")
- **Gridded NUCAPS: Lapse Rates fix**
- Polar Blended Hydro products w/ Metop-C, NOAA-21 inputs
- **Improved handling of VIIRS imagery**
 - Reduce overlap between successive overpasses
 - Avoid misplaced granules

New / changed CAVE menu entries:

- **VIIRS imagery from NOAA-21, NOAA-20, S-NPP**
 - Change "SNPP ..." to "S-NPP / NOAA-21 ..."
 - Combine NOAA-21, NOAA-20, S-NPP imagery
- Remove GOES-West Hawaii regional sector
- Remove GOES-East Puerto Rico sector Bands 11, 12, 14, 16 (and imagery composites that use those bands)
- Hide: AMSR-2 and ATMS derived products (Conus only)
- WPC Excessive Rainfall Outlook (5-day vs 3)
- GOES-R Storage slot Menus (@ 105° Longitude)
- Includes Alaska Region Customizations (for Alaska version of RPM)

And the **AWIPS Pre-Processor ("APP")**

... see next slide



Coming soon: APP (AWIPS Pre-Processor)



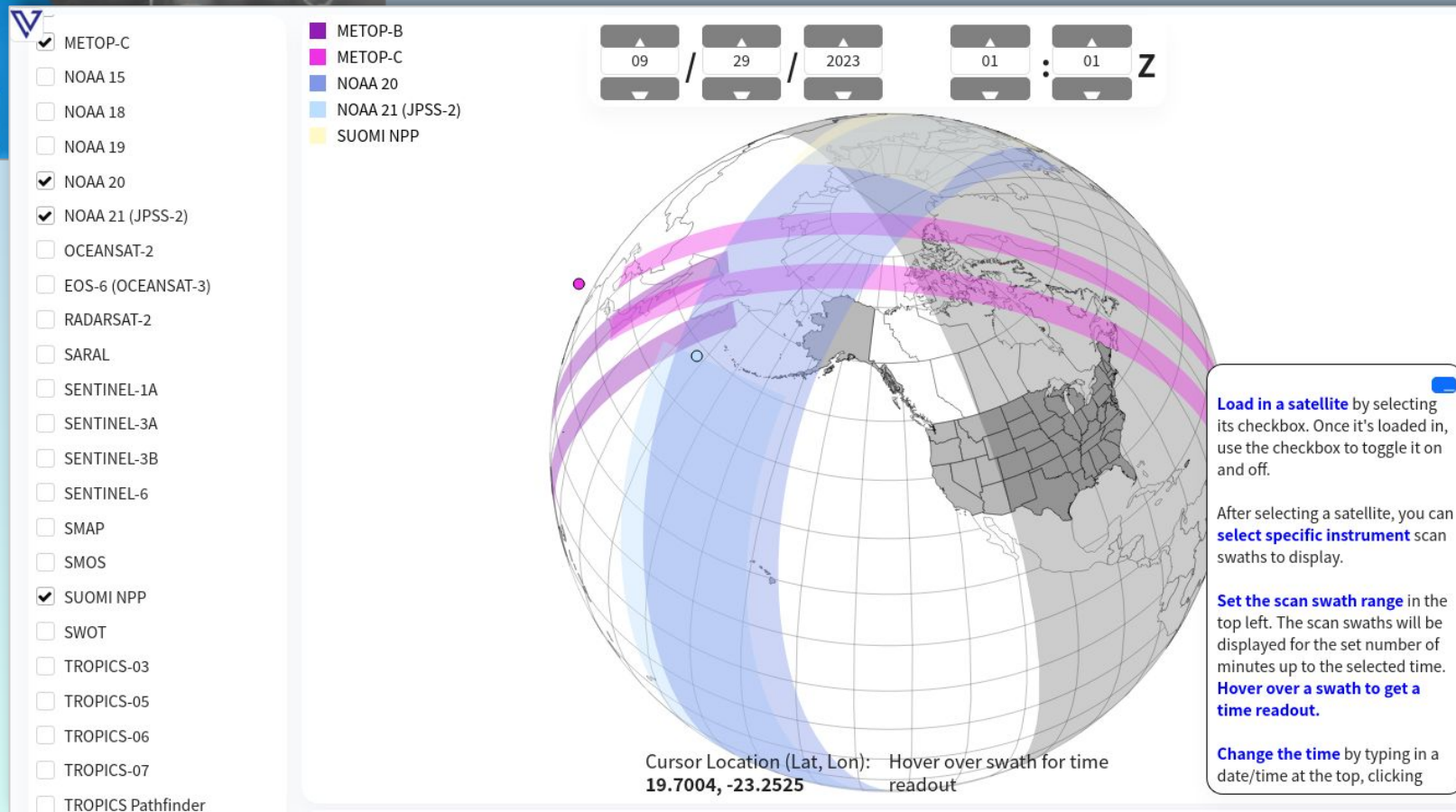
- APP = a small bundle of software running alongside AWIPS, that can automate site configurations and manipulate incoming data products – e.g., to
 - Produce **CIRA Geocolor imagery** from GOES-East/West ABI channels 1, 2, 3, 7, and 13;
 - Compute **GLM 5-minute accumulations** (FED/TOE/MFA) from 1-min GLM grids;
 - Adjust **LDM *pgact* entries** to get new data products via the SBN or NWS Regional LDM
- This avoids sending data over SBN or LDM that could be computed locally (from data already received)



Polar Planner on VLab



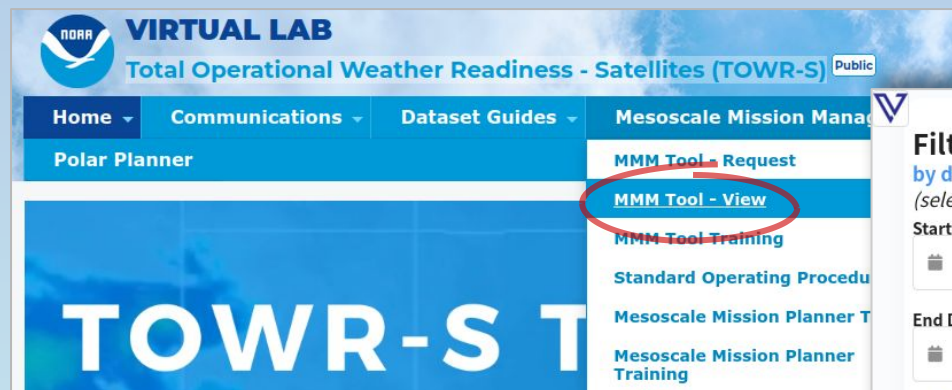
- Locate the current / past / future locations of 32 Low-Earth Orbit satellites
- Choose "Polar Planner" from the TOWR-S page on VLab (<https://vlab.noaa.gov/web/towr-s/>)



<https://vlab.noaa.gov/web/towr-s/mmm/polar-planner>



Meso Mission Viewer



- Locate current / past / future locations of GOES-East/West mesoscale sectors
- Choose "MMM Tool - View" from the TOWR-S page on VLab (<https://vlab.noaa.gov/web/towr-s/>)

Filter Mesos: by date range: (selected dates included)

Start Date:

September 21, 2023

End Date:

October 5, 2023

Apply Date Range

Reset Date Range

by keyword:

Search for:

Add search terms separated by commas (e.g. 'winter storm, warning, advisory')

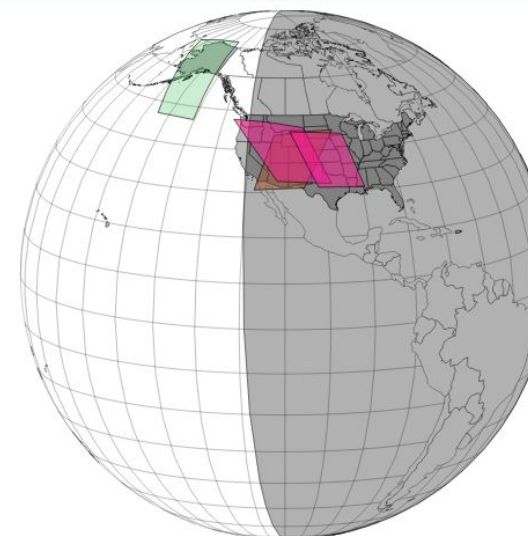
Apply Keywords

Clear Keywords

by area:

Apply a Search Area

Search for meso requests whose center points are within a defined geographical region



Welcome to the MMV

Mesoscale Mission Viewer

Here's a quick guide to help you navigate the page:

In the middle of the page is your **globe**.

You can use the **scroll wheel** to **zoom**, **click and drag** to **rotate** the globe, and **hold shift then click and drag** to **pan**.

Below is an interactive **timeline**.

Select a time by clicking anywhere on the timeline. The active mesos for that time will appear on the globe, and more information will be shown in the **active mesos table** to the right of the timeline.

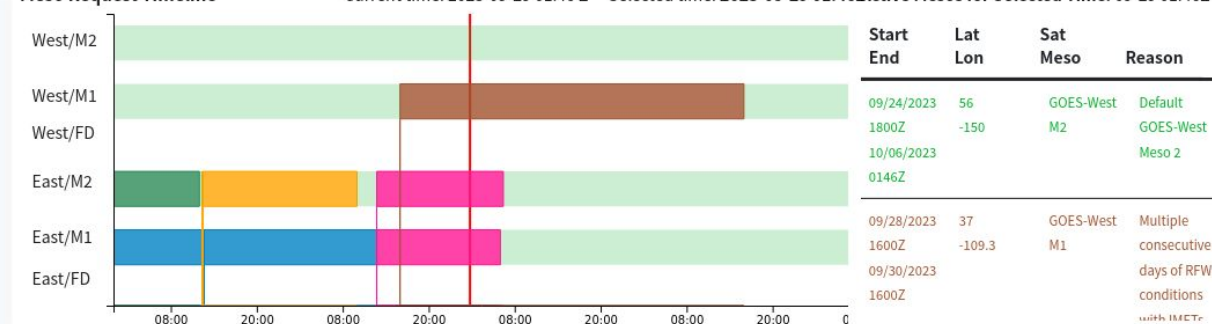
You can move the timeline around by using the **scroll wheel to zoom** or

Meso Request Timeline

Current time: 2023-09-29 01:46 Z

Selected time: 2023-09-29 01:46 Z

Active Mesos for Selected Time: 09-29 01:46Z



<https://vlab.noaa.gov/web/towr-s/mmm/meso-view>



ISatSS in IDP and NWS National Centers



ISatSS = Integrated Satellite Support System

Recently completed:

- NHC: Meteosat-based ProxyVis
- AWC: Test ISatSS on RHEL 9
- OPC: ProxyVis G16/18 AWIPS tiles
- OPC: Geocolor G16/18 AWIPS tiles
- OPC/SAB: Sentinel-6a Wave altimetry

In progress:

- NHC: Global IR Mosaics
- SAB: SSMIS imagery and RGBs
- SAB: GPM GMI
- OPC/SAB: FG16/G18 Full Disk Fog & Low Stratus
- OPC/SAB: AMSR-2 Ocean & MBT
- OPC/SAB: ATMS 88GHz Qv imagery
- OPC/SAB: Jason-3 Wave altimetry

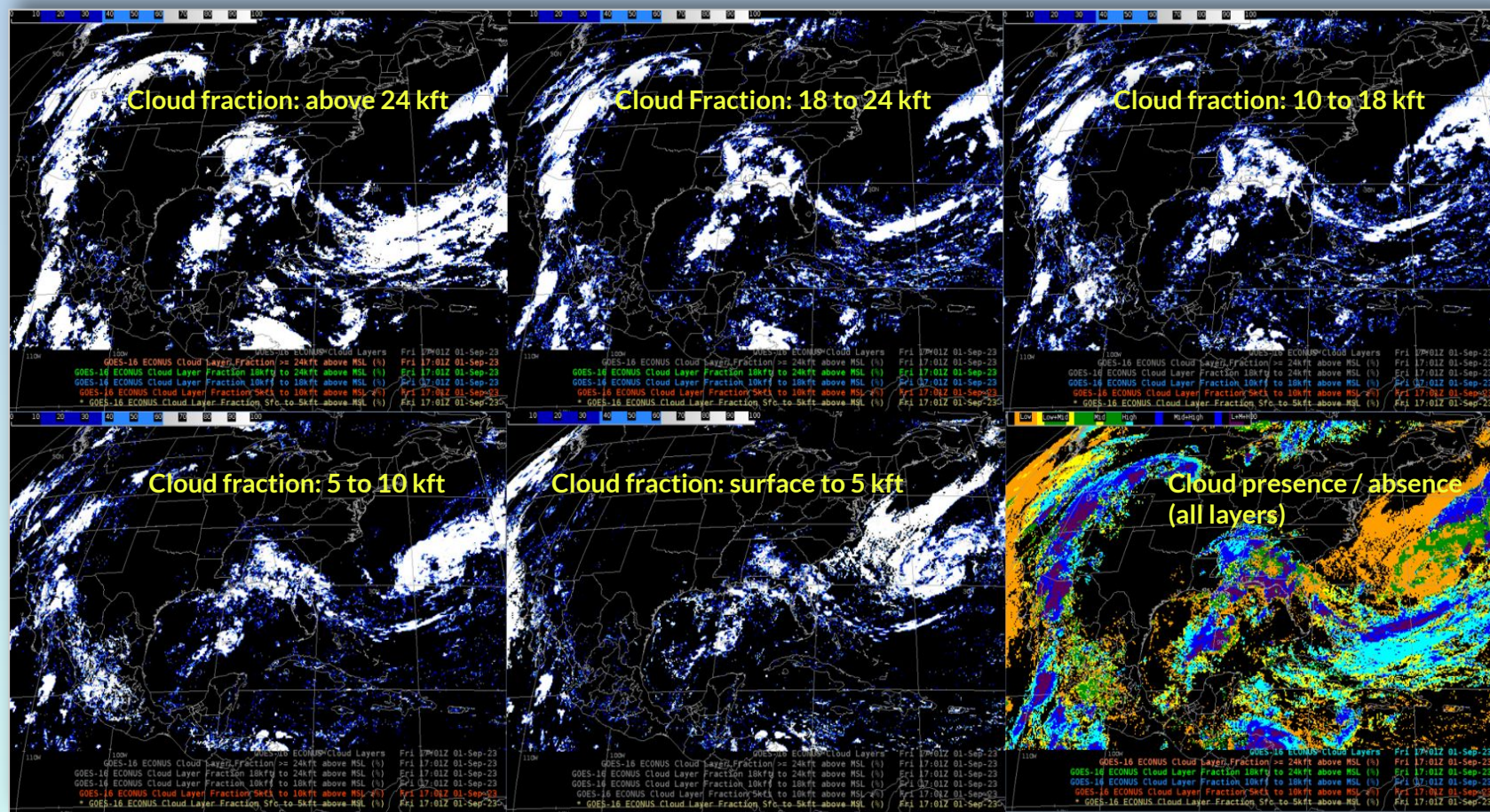
TOWR-S Configuration Control Board

- Meets monthly to get input from stakeholders (on ISatSS, RPMs, MMM, APP)
- Next meeting: Friday, October 20

2. Recent and upcoming satellite data products / changes



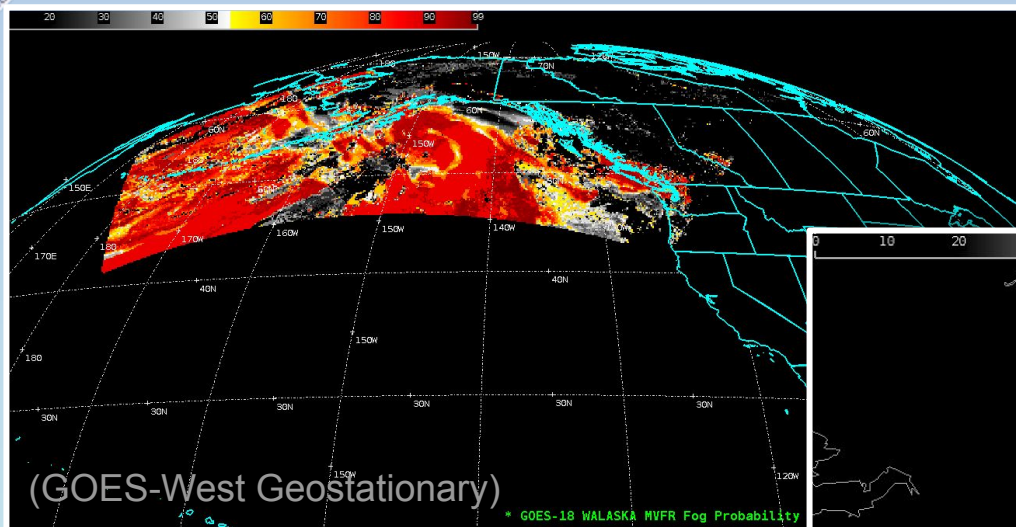
Coming to SBN Oct. 23: GOES-East/West Cloud Cover Layers



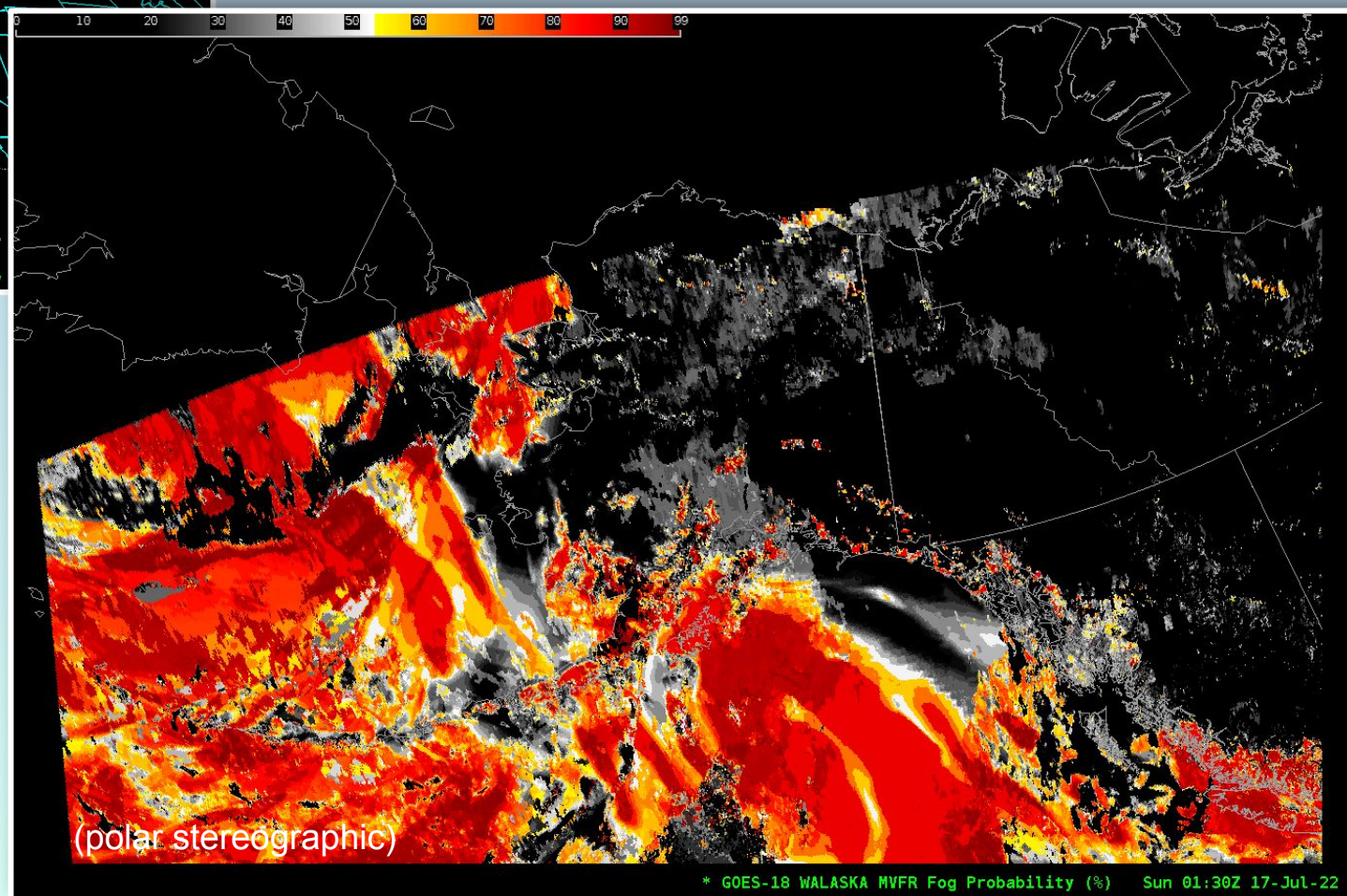
h/t V Wegman

- Cloud fraction estimates in 5 altitude layers:
 - Full Disk and CONUS sectors: 10 km resolution; every 60 minutes*
* CONUS will soon be every 5 minutes
 - Mesoscale sectors: 4km; every 5 minutes
- More information can be found in the [Dataset Guide](#) or in NWS Service Change Notice [SCN23-93](#) (posted Sept. 20).
- TOWR-S RPM v24 ([see above](#)) will configure AWIPS to handle and display this product.

GOES-R Fog & Low Stratus: Alaska sector



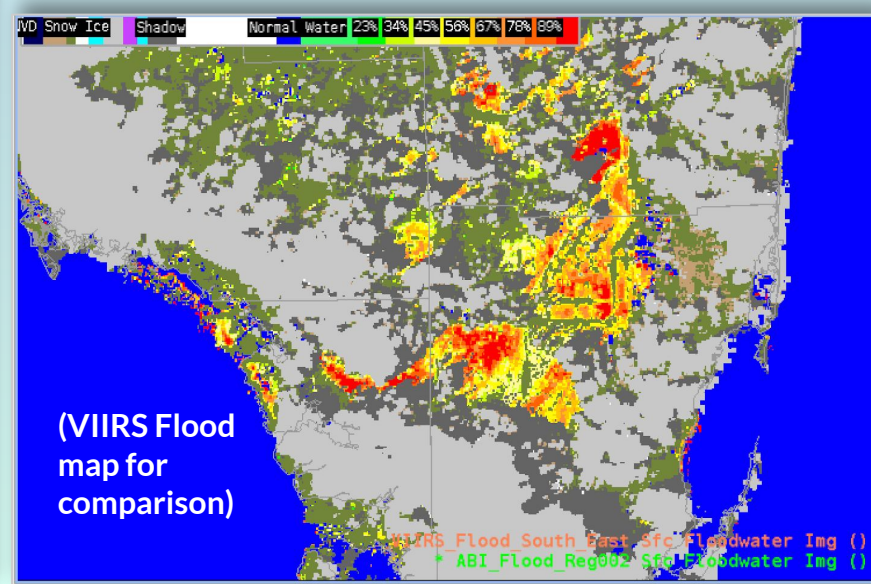
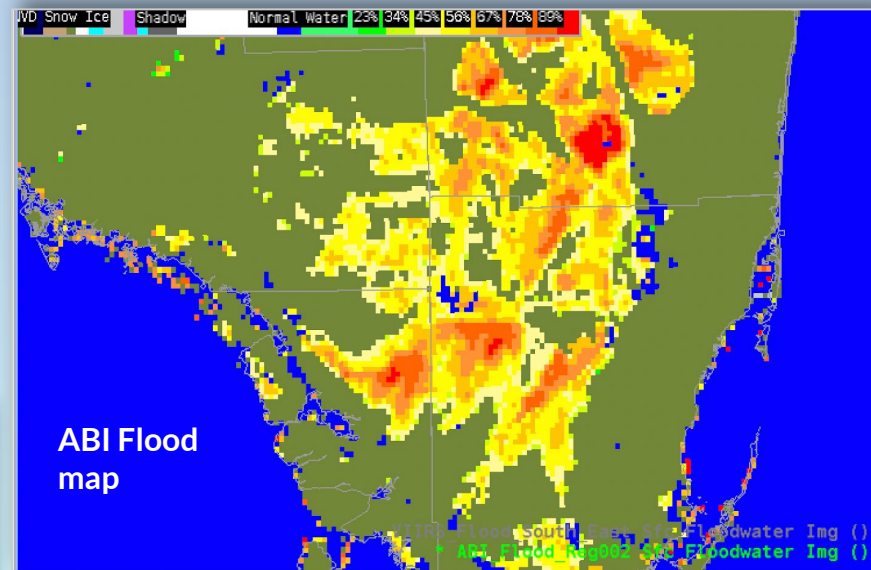
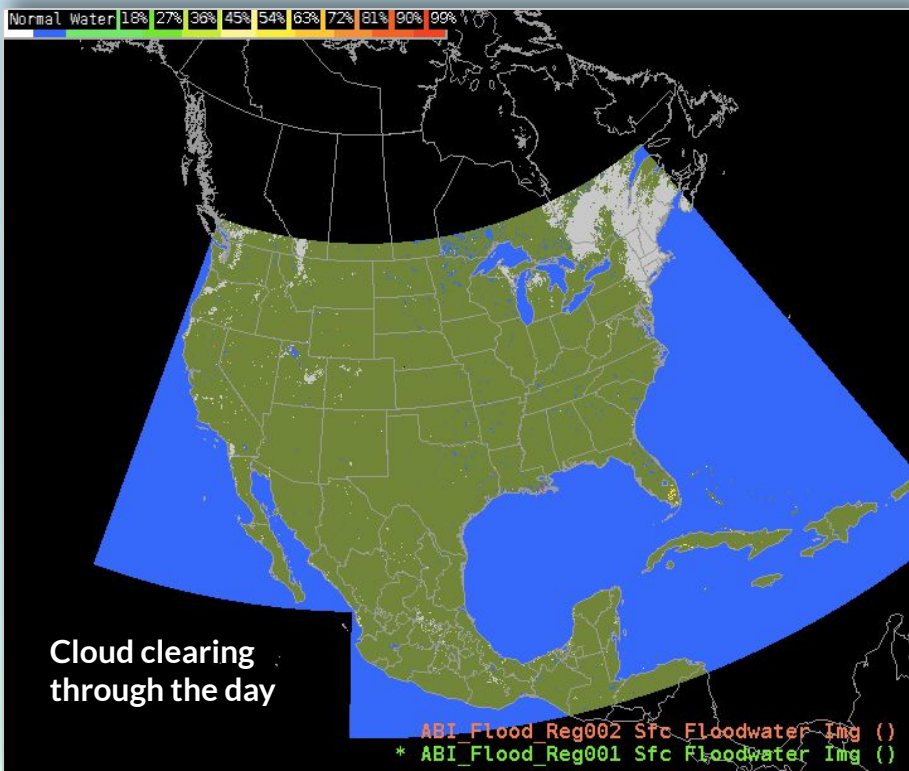
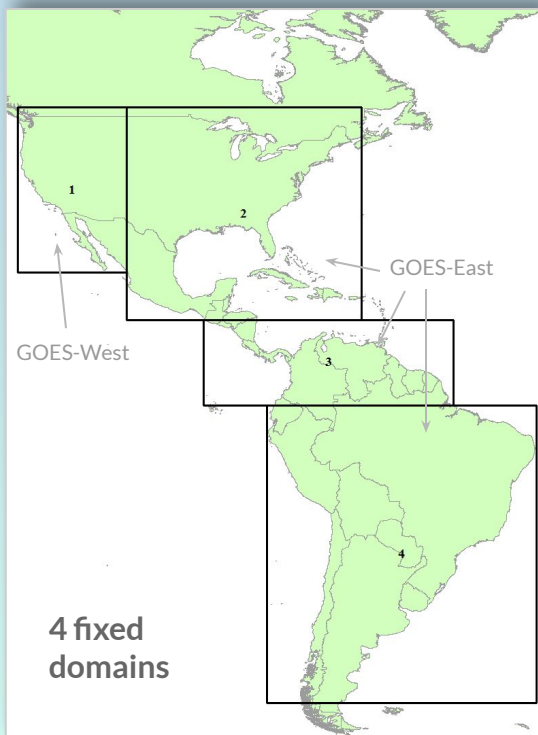
- This subset of the geostationary Full Disk product covers the Alaska sector (defined in a Polar Stereographic projection).
- Product evaluation and user engagement are in process.





Under evaluation: GOES-R ABI Flood Maps

- Daily and hourly composites: maximum flood fraction between each day's first daytime observations and...
 - ...the last daytime observations (*daily*); or
 - ...the current hour's observations (*hourly*)
- Lon/lat grid @ 0.01 degree (~1km) resolution

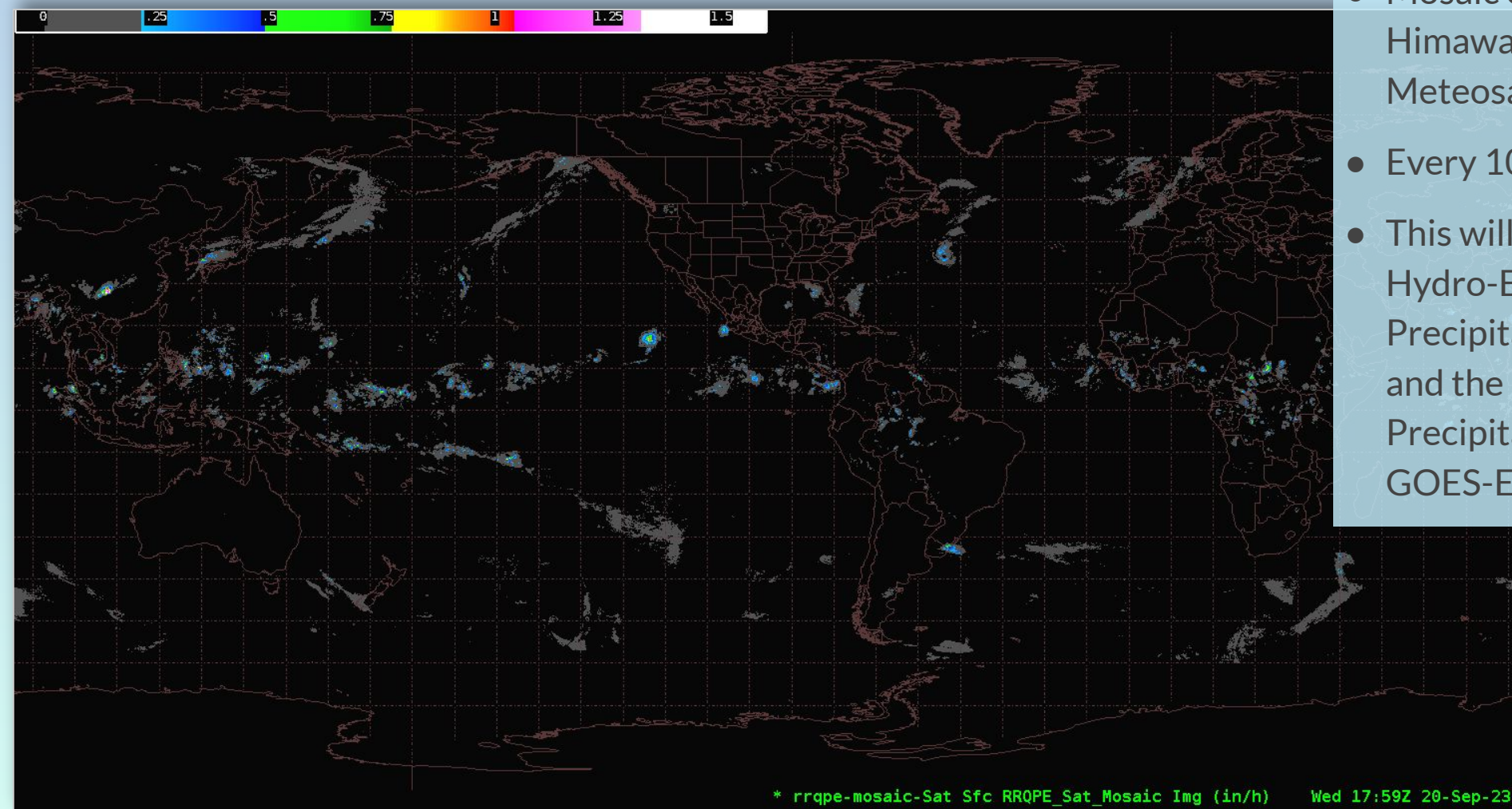


h/t Derek Van Pelt



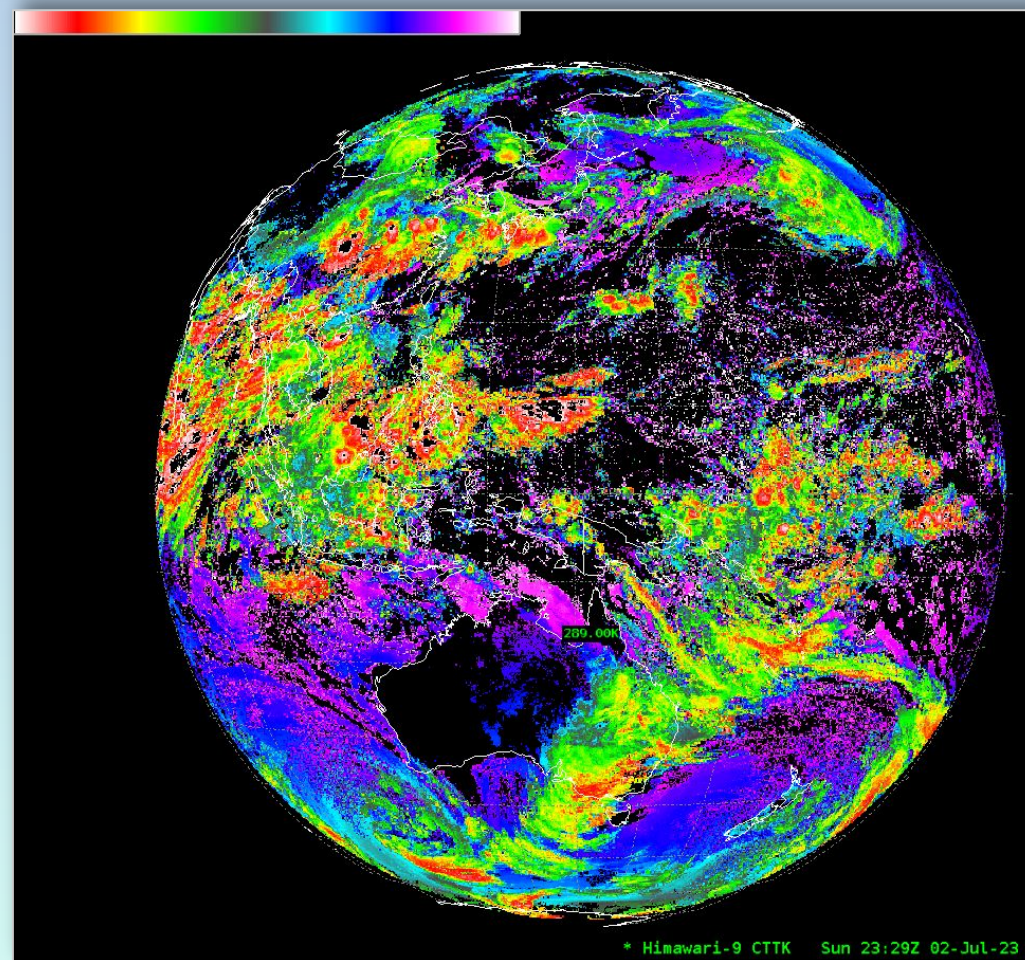
Under evaluation: Global Geo Blended Rainfall Rate

- Mosaic of rain rate estimates from Himawari-9, GOES-East, GOES-West, Meteosat-9, and Meteosat-10
- Every 10 minutes; also every hour
- This will replace the Global Hydro-Estimator (a.k.a. Satellite Precipitation Estimate, SPE) and the Rain Rate / Quantitative Precipitation Estimate (RRQPE) from GOES-East/West



Himawari-9 L2 products -> Pacific Region

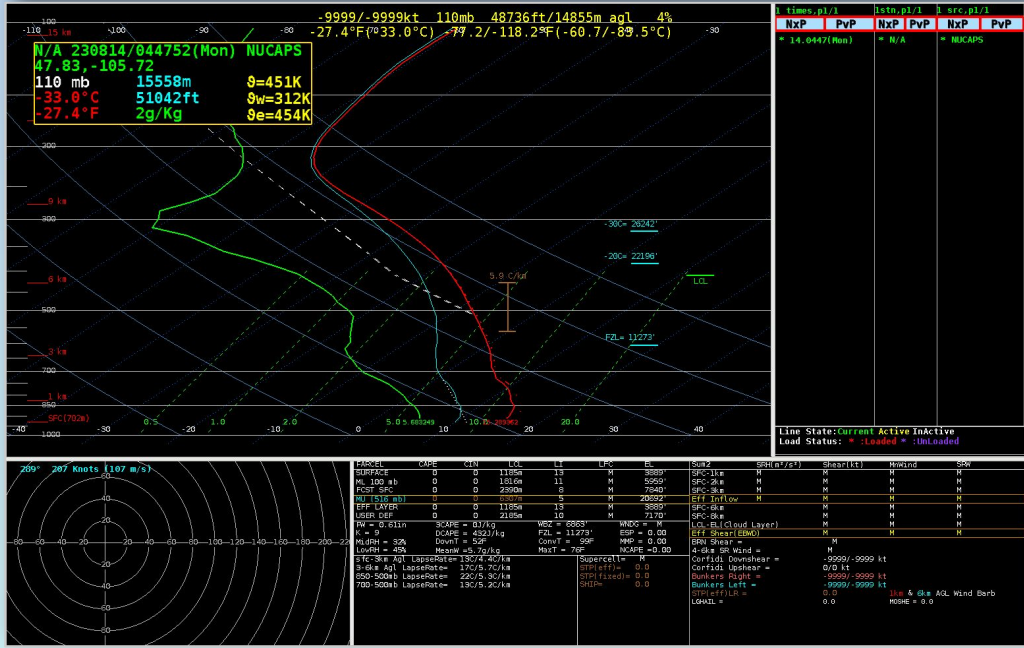
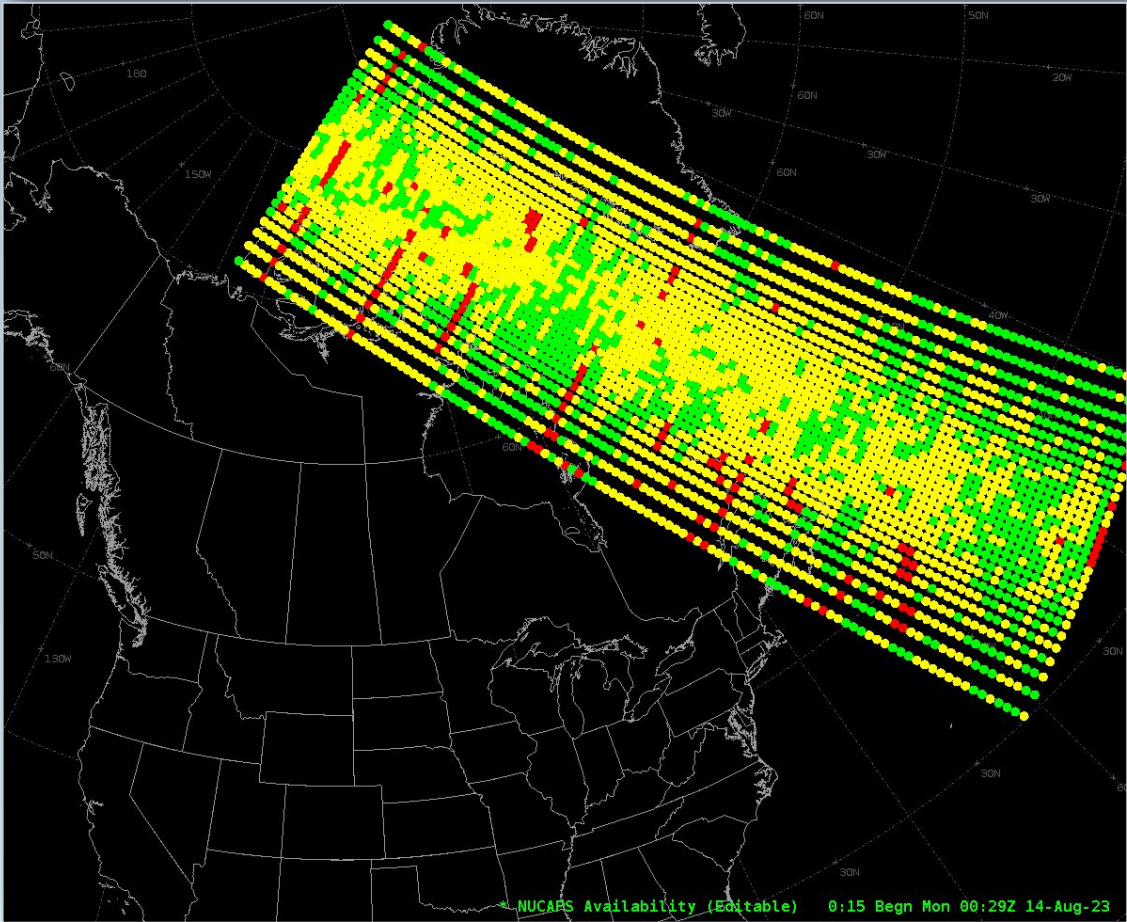
- Pacific Region has been receiving operational **Himawari-9** imagery since Dec. 12, 2022; and **Himawari-9 Derived Motion Winds** (thinned, pre-operational) since Apr. 19, 2023.
- Pacific Region is now also receiving Cloud L2 products from NESDIS via NCF and ingesting them into AWIPS:
 - Cloud Top Phase
 - Cloud Top Height
 - Clear Sky Mask
 - Cloud Top Temperature
 - Cloud Top Pressure
 - Cloud Optical Depth
- Additional products expected this fall:
 - Derived Motion Winds (operational)
 - Rain Rate
 - Sea Surface Temperature



Near-Real-Time Himawari-9 Cloud Top Temperatures in AWIPS



NUCAPS Soundings from Metop-B,C



- Mid-morning soundings, ~ 4 hours before NOAA-20/21
 - (See Polar Planner, [above](#))
- Under consideration for SBN dissemination, beginning in Jan./Feb. 2024



GOES-R Satellite Cloud Products (SCP): Streamlining maintenance



Text 2: WMO:TCUS40KNE5

File Edit Options Version Tools Scripts Products

AWIPS Browser Load History WMO Search Enter Editor ☐ Accum ☐ Update Obs Clear

AWIPS ID: WMO TTA# CCCC: AFOS Cmd:

TCUS40 KNE5 301702
SCPER1
SATELLITE-DERIVED CLOUD INFORMATION FOR MID (CLD TOPS 631-400 MB) AND
HIGH LEVEL (CLD TOPS ABOVE 400 MB)
(MAR) (month of year)

STA	DA/TIMEZ	MID	HIGH	CLD TOP	ECA
CT	30/1650	OVC	270-320	71	
KBDL	30/1650	OVC	250-320	76	
KDNR	30/1650	OVC	250-310	65	
KGON	30/1650	OVC	260-310	71	
KHFD	30/1650	OVC	270-310	71	
KHVN	30/1650	OVC	270-320	79	
KIJD	30/1650	OVC	260-310	67	
KMMK	30/1650	OVC	270-320	76	
KOXC	30/1650	OVC	260-320	79	
DE					
KDOV	30/1650	SCT	140-300	1	



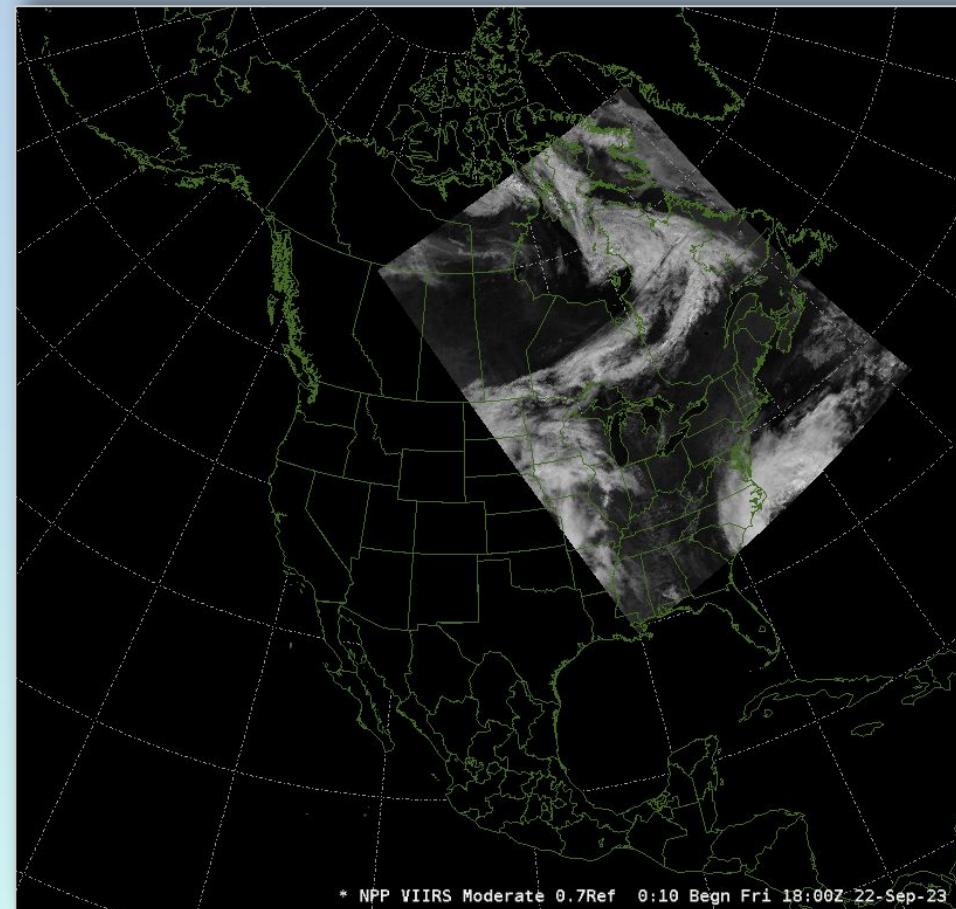
- As of Aug. 11, 2023, SCPs are using station locations from the AWIPS National Dataset Maintenance (NDM) list
- This provides SCPs for a more comprehensive, current, & accurate set of station locations - updated on a routine / regular basis.
- For details see the [Dataset Guide](#) or NWS Service Change Notice [23-92](#).



NOAA-21 VIIRS Day-Night Band Imagery



- **NOAA-21 VIIRS NCC imagery** was activated on the Satellite Broadcast Network (SBN) on **July 13, 2023**. (see *NWS Service Change Notice* [SCN23-64](#))
- More on NOAA-21 data products [below](#)



VIIRS Day-Night Band NCC Imagery
from S-NPP, NOAA-20, and NOAA-21

3. NOAA-21 Transition to operations



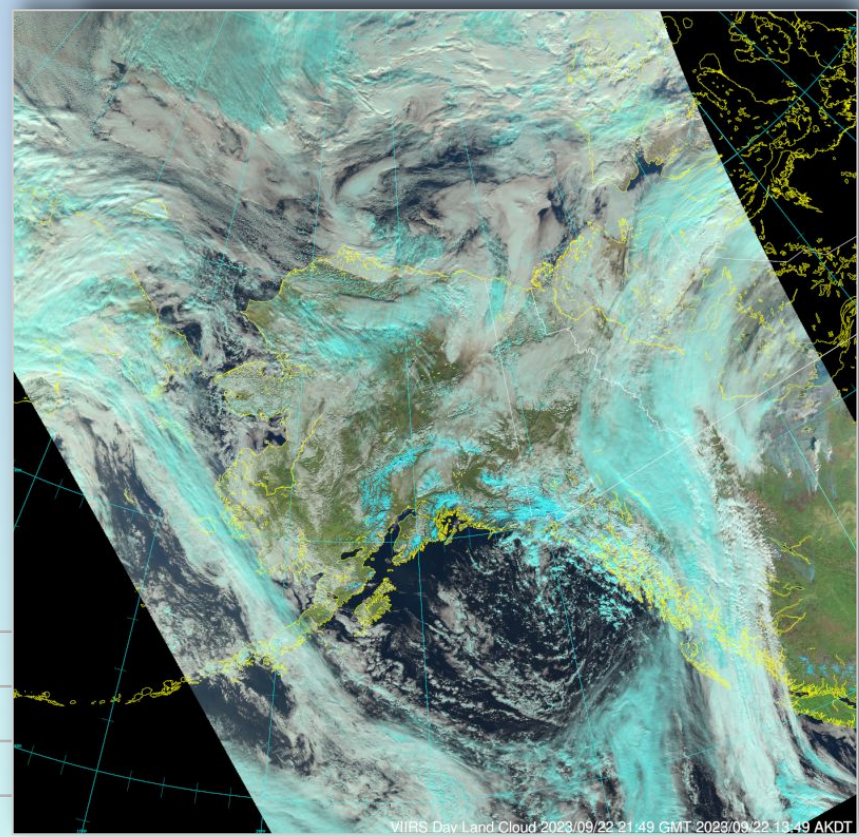
NOAA-21 Transition to Operations (T2O): Alaska



- 1. Direct Readout via 2 antennas in/near Fairbanks, Alaska
("Sandy Dog" @ Gilmore Creek / "Big Dog" on UAF Campus)
 - Geographic Information Network of Alaska (GINA) and NWS Alaska Reg. HQ are producing Imagery and Derived Products using the Community Satellite Processing Package ([CSPP](#)) v4.0.
 - 2. VIIRS Imagery "Key Performance Parameters" (KPPs)* sent to Alaska Reg. HQ from NESDIS/PDA via NCF over LDM
- * VIIRS I1, I3, I4, I5, M14, M15, M16, and DNB / NCC imagery granules for the Alaska Region, tailored for AWIPS. (See AWIPS/VIIRS Imagery [Tailoring Specifications](#))

NWS Alaska has confirmed acceptable performance of VIIRS imagery at the following sites:

	VIIRS tiles from Direct Readout Antenna	VIIRS granules from NESDIS/PDA
NWS Alaska Region HQ (VRH)	✓	✓
WFO Anchorage (AFC)	✓	✓
WFO Fairbanks (AFG)	✓	✓
WFO Juneau (AJK)	✓	✓
Alaska-Pacific River Forecast Center (APRFC)	✓	✓
Alaska Aviation Weather Unit (AAWU)	✓	✓
Anchorage Volcanic Ash Advisory Center (VAAC)	✓	✓
Anchorage Consolidated Weather Service Unit (CWSU)	✓	✓
Alaska Sea Ice Program (ASIP) (non-AWIPS software)	✓	✓



NOAA-21 VIIRS Day Land Cloud RGB (via GINA)
2023/09/22 13:49 AKDT (21:49z) ([source](#))



NOAA-21 T2O: WFOs and RFCs

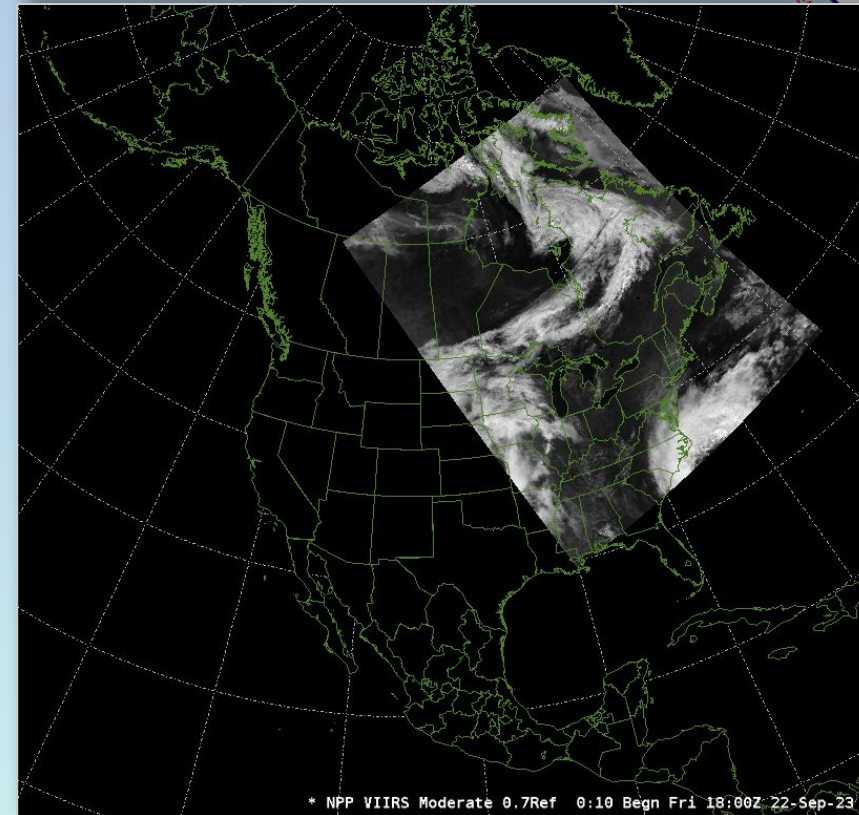


- **NOAA-21 VIIRS NCC imagery** was activated on the Satellite Broadcast Network (SBN) on **July 13, 2023**. (see NWS Service Change Notice [SCN23-64](#))

- NOAA-21 VIIRS observations of the CONUS, Pacific, and Puerto Rico regions, tailored for AWIPS
- In AWIPS CAVE, "S-NPP ..." menu entries will display VIIRS NCC imagery from both S-NPP and NOAA-21
 - Until menu entries are updated by TOWR-S RPM v24 ([see above](#)). In the meantime,
- See "[Tips for Improved Handling of JPSS VIIRS Imagery in AWIPS](#)" to
 - Correct text in CAVE menu entries
 - Reduce overlap between successive overpasses
 - Avoid misplaced granules

- Other NOAA-21 products coming to AWIPS this fall / winter:

- NOAA-21 **VIIRS Active Fires**
- NOAA-21 **VIIRS Flood Maps**
- NOAA-21 **NUCAPS** soundings
(alongside NUCAPS from NOAA-20 and maybe from Metop-B,C)
- Global **Blended Hydro Products** with NOAA-21 inputs
- Others TBD



VIIRS Day-Night Band NCC Imagery from S-NPP, NOAA-20, and NOAA-21

Menu Item	Time
CONUS VIIRS Day-Night Band NCC (0.7 μm)	29.1200
Alaska VIIRS Day-Night Band NCC (0.7 μm)	29.1200
Pacific VIIRS Day-Night Band NCC (0.7 μm)	29.1338
Puerto Rico VIIRS Day-Night Band NCC (0.7 μm)	29.0753

[Return to overview](#)



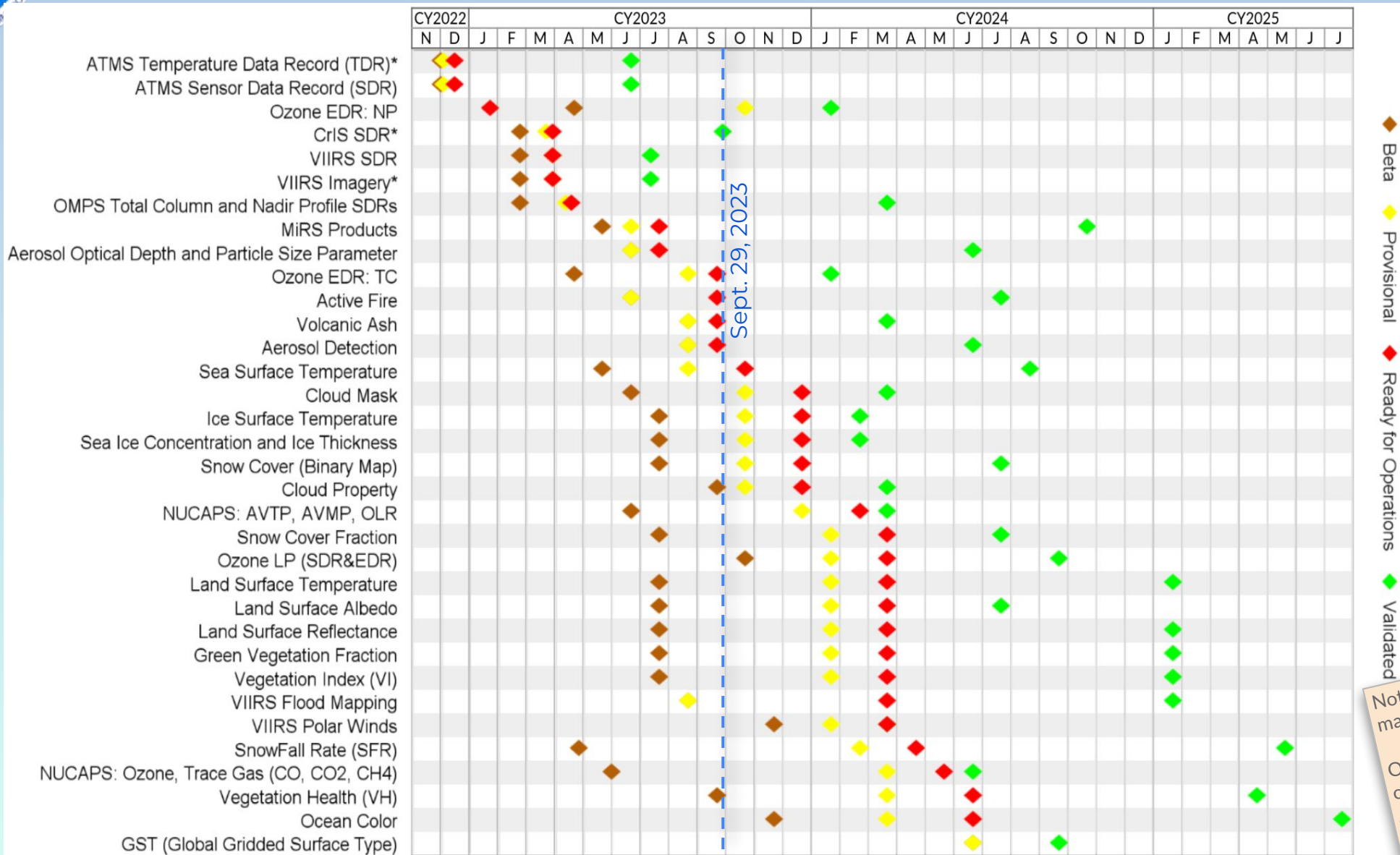
NOAA-21 T2O: Pacific Region & National Ctrs.



- Direct Readout systems in the Pacific Region: Hawaii, Guam
 - NWS Pacific Region HQ is receiving NOAA-21 data products from 2 Direct Readout antennas in Honolulu (NOAA Daniel K. Inouye Regional Center, Honolulu Community College) and evaluating them in AWIPS.
 - Aug. 16: Guam Direct Readout system updates enabled AWIPS integration of NOAA-21 data products.
- National Centers
 - NWP Model assimilation of NOAA-21 CrIS and ATMS data expected in October 2023
 - Several Centers (AWC, NHC, *etc.*) have direct PDA subscriptions
 - Some rely on postprocessing by ISatSS (e.g., MiRS tiles for Nat'l Hurricane Ctr.)
... in particular for use in NAWIPS (legacy / precursor to AWIPS2)



NOAA-21 T2O: Product Maturity timeline



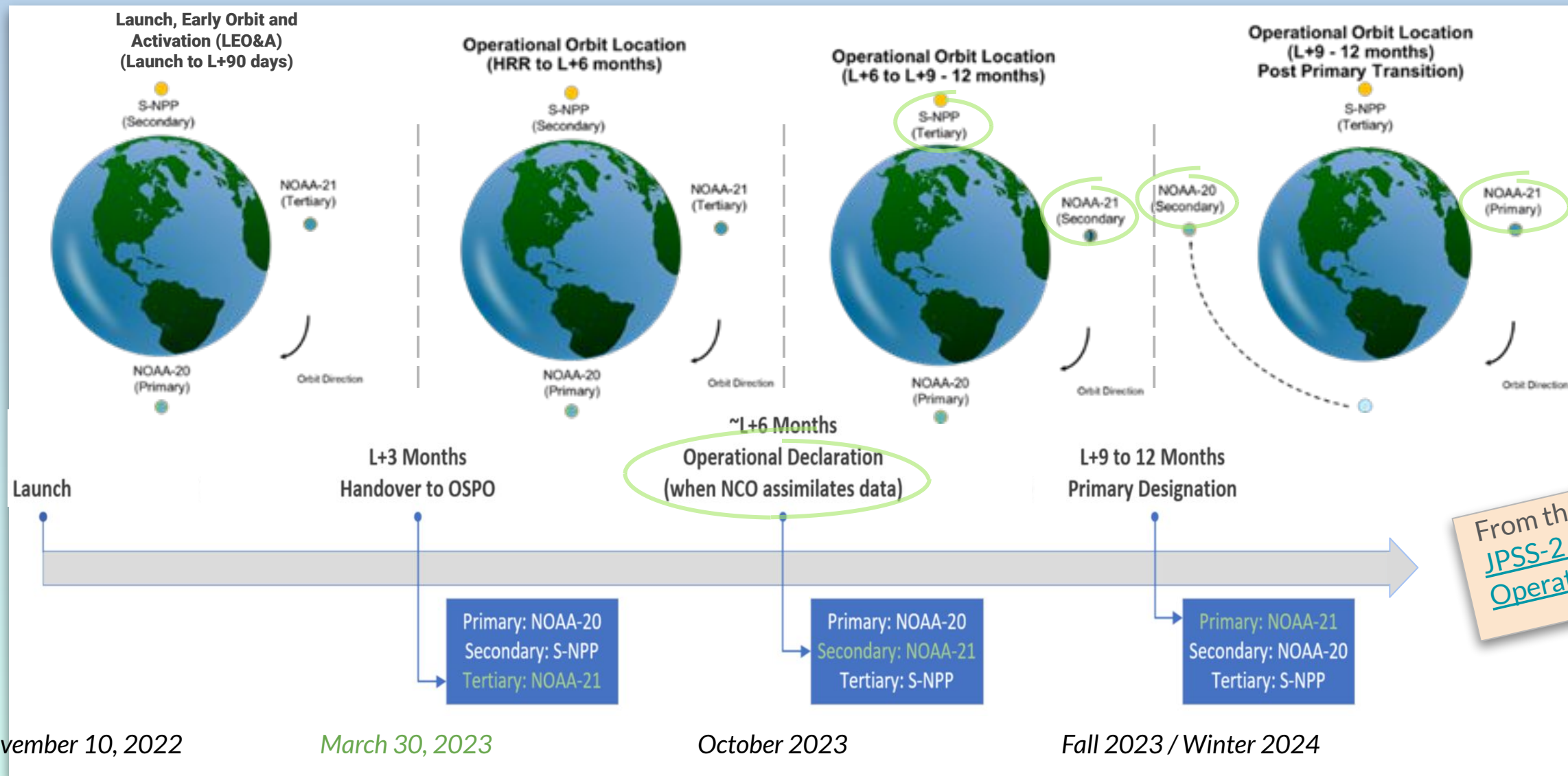
Source: [NOAA-21 Post-launch Product Validation Schedule](#) (updated 2023-09-01)

See also STAR / JPSS [Algorithm Maturity Matrix](#) (updated 2023-09-18)

Not all of these products will be made available in AWIPS.
Of those that are, some will be on the SBN; others may reach AWIPS sites via LDM, Cloud, or other mechanisms.



NOAA-21 T2O and the JPSS Constellation





NOAA-21 T2O: NWS Operational Test & Evaluation (OT&E)



- OT&E purpose: validate operational requirements independently from end to end in a live environment. Advise recommendation on full deployment to forecast operations.

- [OT&E schedule](#) - multiple phases Aug. 2023 - Mar. 2024:

- NOAA-21 VIIRS imagery for Alaska ([Aug.-Sep. 2023](#))
 - 1. Imagery tiles via Direct Readout processed at GINA and AK HQ
 - 2. Imagery granules from NESDIS / NCF via LDM
- NOAA-21 VIIRS NCC Imagery via SBN ([Nov.-Dec. 2023](#))
 - Imagery granules for CONUS, Puerto Rico, and Pacific regions (Evaluation will begin when TOWR-S RPM v24 becomes available)
- Revisit VIIRS imagery with NOAA-21 in new orbit (~ [Jan.-Feb. 2024](#))
 - Tiles via Alaska Direct Readout and granules from NESDIS over LDM and SBN
 - Also: Blended Hydro products w/ NOAA-21 inputs
- NOAA-21 NUCAPS soundings ([Feb.-Mar. 2024](#))

	Q4 2023		Q1 2024			Q2 2024			
	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
OT&E - VIIRS OT&E - DRO	09/08/23								
OT&E - NCC/ DNB OT&E - SBN				12/08/23					
OT&E - Blended Hydro Products						02/23/24			
OT&E - VIIRS OT&E - DRO						02/23/24			
OT&E - NCC/ DNB OT&E - SBN						02/23/24			
OT&E - NUCAPS							03/06/24		

h/t Ryan Brown

6 OT&E test sites:

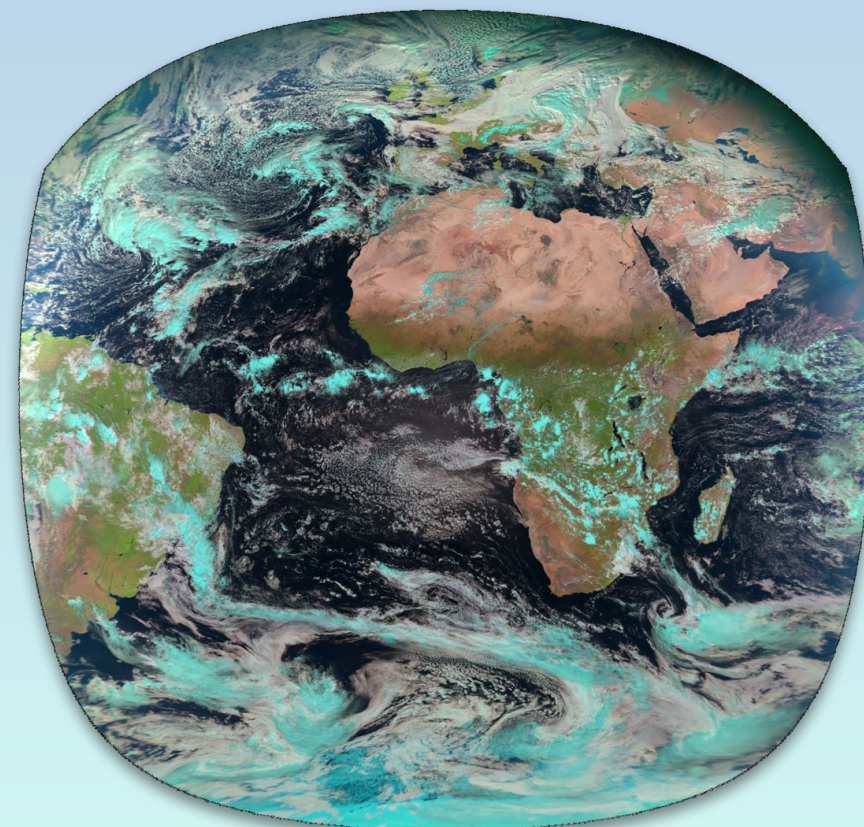
- Alaska Region HQ
- WFO Medford, OR
- WFO Gaylord, MI
- WFO Houston/Galveston, TX
- WFO Buffalo, NY
- RFC Portland, OR

3. New and upcoming satellites

Recent and upcoming satellite launches

- [OceanSat-3](#) (a.k.a. EOS-06) launched Nov. 26, 2022.
 - L1 data checkouts completed in June / July 2023
 - The OSCAT-3 scatterometer will fill the gap left when SCATSAT ceased operations in Feb. 2021.
- (MeteoSat 3rd Gen.) [MTG-Imager 1](#) launched Dec. 13, 2022.
 - Geostationary @ Longitude 0°
 - Will be renamed Meteosat-12 in 2024
 - Expected data availability to NWS: *(rough guesses)*
 - Dec. '23/Jan. '24: Imager L1 data
 - Feb. / Mar. 2024: Imager L2 data
 - Apr. / May 2024: Lightning data

(See MTG-I1 [data availability schedule](#))
- GOES-U scheduled to launch N.E.T. April 30, 2024
- (Metop 2nd Gen.) [Metop-SG-A1](#) to launch [1st Q. CY2025](#).
 - Sun-synchronous polar (morning) orbit



h/t: V Wegman

The view from Longitude 0° (MeteoSat-11)

Appendix



Satellite Book Club (SBC) Seminar Series



VIRTUAL LAB
Total Operational Weather Readiness - Satellites (TOWR-S) Public

Home - Communications - Dataset Guides - Mesoscale Mission Manager - **Satellite Book Club** - TOWR-S RPM - VuSat

SATELLITE BOOK CLUB (SBC) VIDEO SEARCH TOOL

Total Operational Weather Readiness-Satellites (TOWR-S) Team

Satellite Book Club Video Search

altimeter Search

SBC Session 48 - Satellite Data in the Graphical Forecast Editor

SBC Session 48 - Satellite Data in the Graphical Forecast Editor

Satellite Book Club – GFE basics

Satellites Data in GFE

Margaret Curtis
WFO GYX

Watch on YouTube

Transcriptions and timestamps for selected video

Total Results: 5

Timestamp	Transcript
26:20	and even the altimeter wind speeds
26:18	yeah and the altimeter wave heights
12:40	something to get looked at altimeters
26:39	we've got I think six altimeters right
38:40	wind speeds out of the altimeters is one

USA.gov US Dept of Commerce National Oceanic and Atmospheric Administration National Weather Service

Disclaimer Information Quality Help Glossary Acronyms

Privacy Policy Freedom of Information Act (FOIA) About Us Career Opportunities

- Thursdays, usually at Noon ET
- Usage examples shed light on user requirements for satellite data products and capabilities.
- Recordings are on [YouTube](#) and the [NWS Commerce Learning Center \(CLC\) website](#).
- Full-text transcripts are available for all SBC sessions – searchable from within VLab.
- SBC videos are now searchable by keyword: <https://vlab.noaa.gov/web/towr-s/sbc-video-search>

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TOWR-S Product Posture



VIRTUAL LAB

Total Operational Weather Readiness - Satellites (TOWR-S)

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TOWR-S PRODUCT POSTURE

The Product Posture lists the products serviced by the TOWR-S Team, available to the National Weather Service. Not all products are available at all sites.

Product Name	Satellite	Sensor	Geophysical Domain	Parameter	Sector	Distribution Path	Distribution Source	WMO Header
Cloud Optical Depth	GOES East/West	ABI	Clouds	Cloud Optical Depth	Full Disk, CONUS, Mesoscale	SBN EXP	PDA	IXTY[80]1 KNES
Cloud Optical Depth	Himawari	AHI	Clouds	Cloud Optical Depth	Full Disk	TBD	PDA	IXTY77 KNES
Cloud Top Pressure	GOES East/West	ABI	Clouds	Cloud Top Pressure	Full Disk, CONUS	SBN EXP	PDA	IXTX[80]1 KNES
Cloud Top Pressure	Himawari	AHI	Clouds	Cloud Top Pressure	Full Disk	TBD	PDA	IXTX77 KNES
Cloud Particle Size	GOES East/West	ABI	Clouds	Cloud Particle Size	Full Disk, CONUS, Mesoscale	SBN EXP	PDA	IXTW[80]1 KNES
Derived Motion Winds	GOES East/West	ABI	Atmosphere	Derived Motion Winds	CONUS, Mesoscale	SBN GRE/GRW	PDA	IXTU[89]9 KNES
Derived Motion Winds	Himawari	AHI	Atmosphere	Derived Motion Winds	Full Disk	TBD	PDA	IXTU77 KNES
Soundings (Legacy Vertical Temperature Profile)	GOES East/West	ABI	Atmosphere	Profiles	CONUS, Mesoscale	SBN EXP	PDA	IXTQ[89]9 KNES

Showing 1 to 28 of 28 entries (filtered from 75 total entries)

VLab now hosts a table of all satellite data products that TOWR-S is involved with (integrating them into NWS forecast operations).

Instant search, filter, and sort capability provides access by keyword, satellite, sensor, etc.

Many rows link to [Dataset Guides](#) with more AWIPS details.

Note: Distribution Path “TBD” indicates a product in planning - not yet disseminated to users

<https://vlab.noaa.gov/web/towr-s/product-posture>



TOWR-S monthly news



- Supplements the quarterly TOWR-S Update briefings and the weekly / occasional TOWR-S mailers.
- Emailed to TOWR-S Update attendees and posted to VLab. (<https://vlab.noaa.gov/web/towr-s/communications>)

TOWR-S COMMUNICATIONS

September News

Updated September 6, 2023

Recent Updates

New GOES-R Cloud Cover Layers Product for AWIPS

A new, AWIPS-compatible GOES-R Cloud Cover Layers data product is coming to the SBN in mid-October 2023. An evaluation of the NWS field utility is being planned.

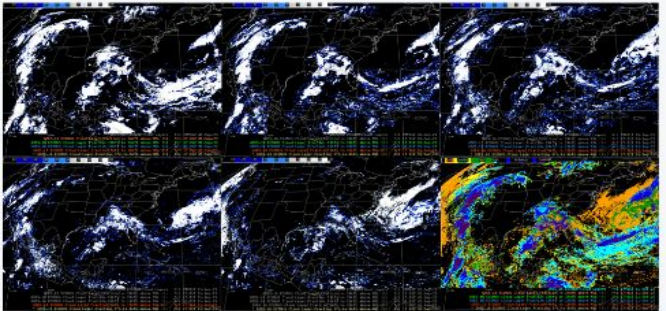


Image caption: Collage of the CCL products in AWIPS (September 1, 2023). From top left: >= 246R above MSL; 18-246R; 10-18R. From bottom left: 5-10R; 5R; all layers.

The product features cloud fraction estimates in 5 altitude layers, hourly at 10 km resolution for the Full Disk and CONUS sectors, and every 5 minutes at 4 km resolution for Mesoscale sectors. Users will need to install TOWR-S RPM v24 (see below) in order to handle and display these products in AWIPS. Until CCL becomes available over SBN, TOWR-S RPM v24 test sites can pull the product from NOAA Open Data Dissemination (NODD) [here](#). More information can be found in the [Dataset Guide](#) or in NWS Service Change Notice (SCN) 23-94, to be posted next week.

Himawari-9 Products Now Available

Himawari-9 Cloud L-2 products are now being disseminated from PDA to the Pacific Region via NCF LDM. These products include Cloud Mask, Cloud Phase, Cloud Height, Cloud Pressure, Cloud Temperature, and Cloud Optical Depth. Users may also find them via NODD [here](#).

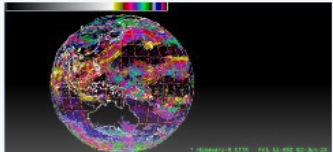


Image caption: Himawari-9 Cloud Top Temperatures in AWIPS (June 2, 2023)

Global Hydro-Estimator Products to be Retired

The Global Hydro-Estimator (GHE) Rain Rate products (also known in AWIPS as Satellite Precipitation Estimate or "SPE") will be retired on November 30, 2023. These may be replaced with a new Enterprise Rainfall Rate Estimate products on SBN. Improvements would include:

- Four additional IR bands;
- A more dynamic calibration scheme;
- Expanded coverage from CONUS to global (between 60S and 70N);
- Grid spatial resolution nearly doubled, from 4km Mercator to 0.02 degrees lat/lon;
- Greater accuracy for light to moderate rainfall estimates.

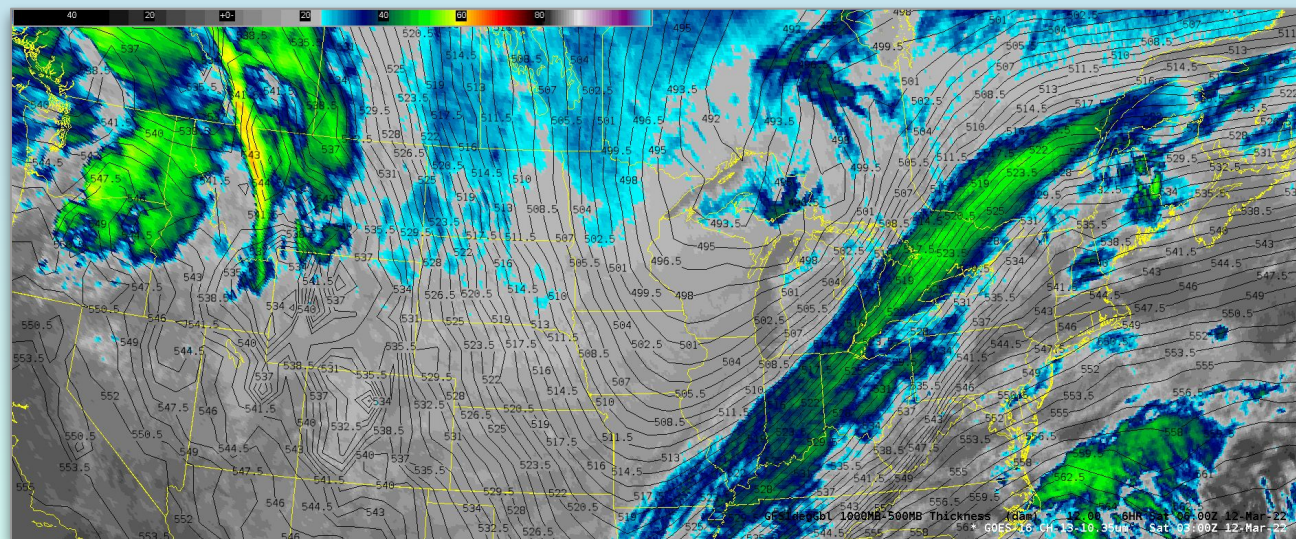
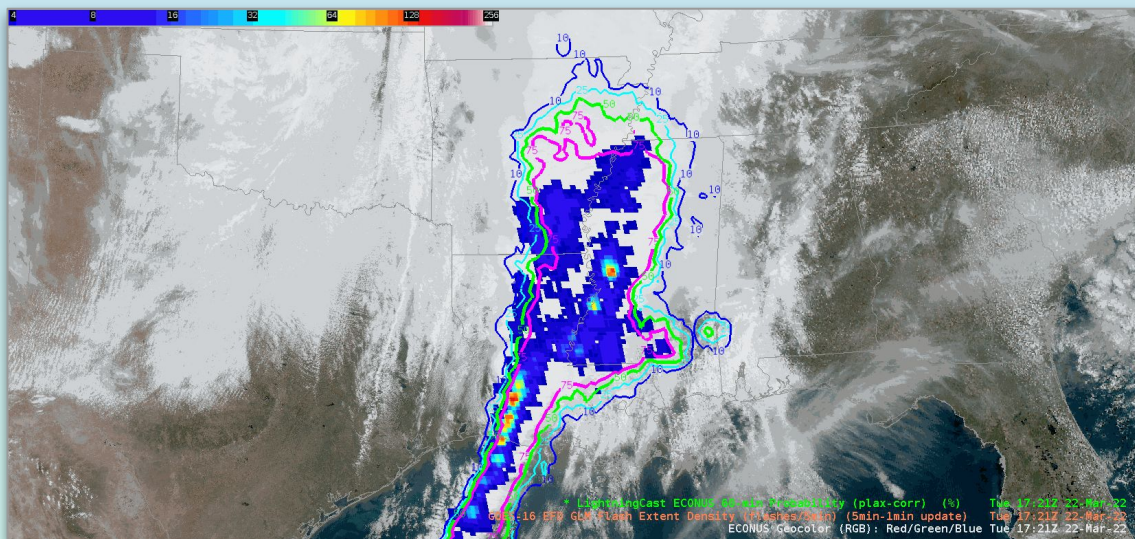
Evaluations of the new global Rainfall Rate product in AWIPS are underway. More information can be found via [OISPS](#).



Cloud-based AWIPS for Collaboration



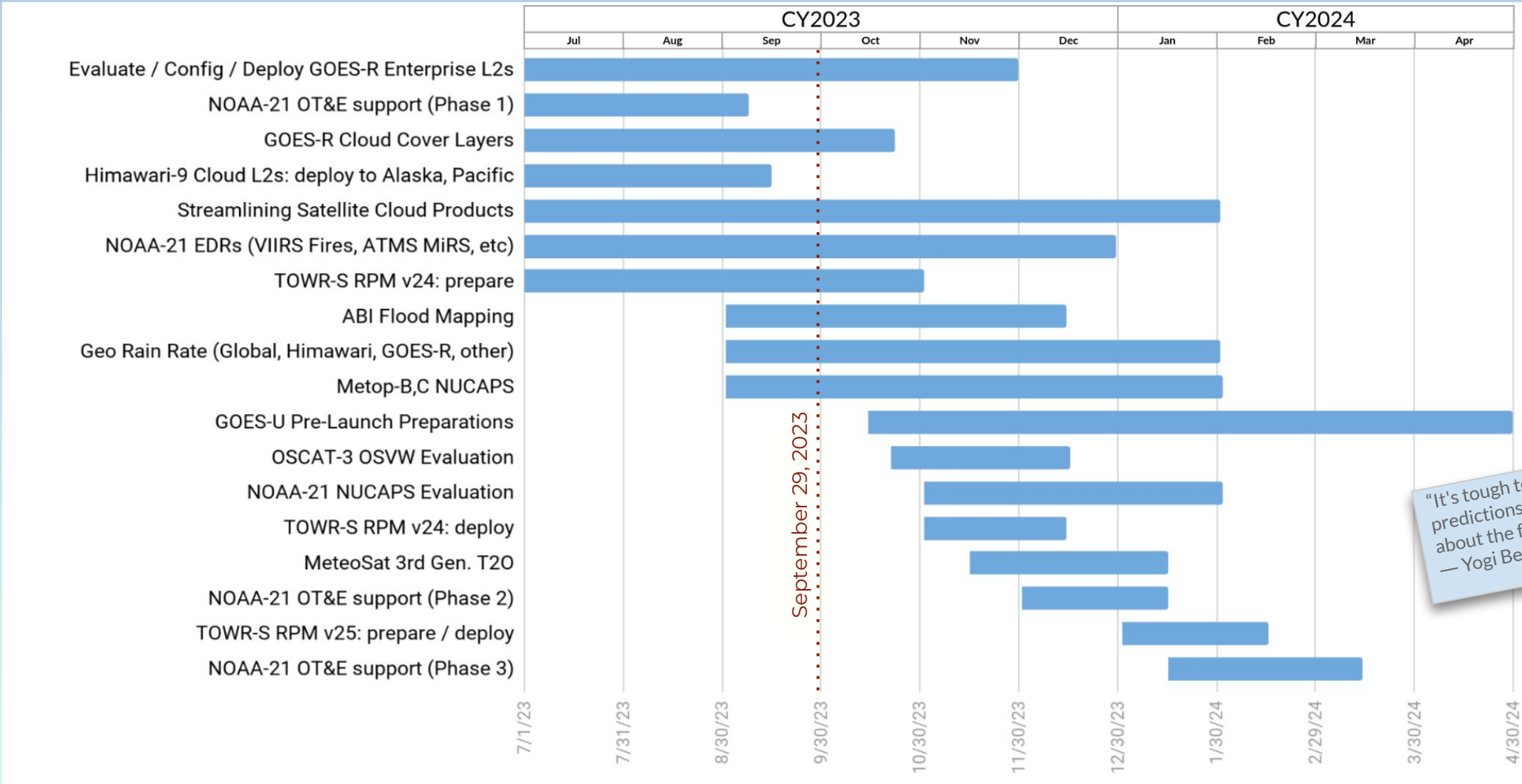
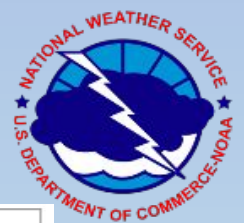
- TOWR-S team has an initiative to bring people together in shared AWIPS sessions to foster collaboration on how satellite data can enhance the NWS mission.
- TOWR-S facilitates small groups of forecasters, technique development meteorologists, and algorithm developers from across the NWS and NESDIS.
- More details are in [Satellite Book Club Session 38](#).
- Please contact Lee Byerle to schedule a session with your office.



n/t: Lee Byerle



TOWR-S Activity Plan



"It's tough to make predictions, especially about the future."
— Yogi Berra



Contact Information



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- Links

- [NWSSChat 2.0 #towr-s Channel](#)
- [TOWR-S on VLab \(https://vlab.noaa.gov/web/towr-s\)](https://vlab.noaa.gov/web/towr-s)



Lapse or no
lapse... We'll
be here



Next TOWR-S Update



(tentative)
Dec. 15, 2023