TOWR-S Update

April 25, 2025

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

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

Office of Observations | GOES-R Program

TOWR-S Team

Total Operational Weather Readiness - Satellites

Overview

1. GOES-East Transition
2. TOWR-S Activities
3. Recent Product Updates
4. Documentation / Communication / Outreach
5. Upcoming Satellites and Products

GOES-East Transition

GOES-East Transition

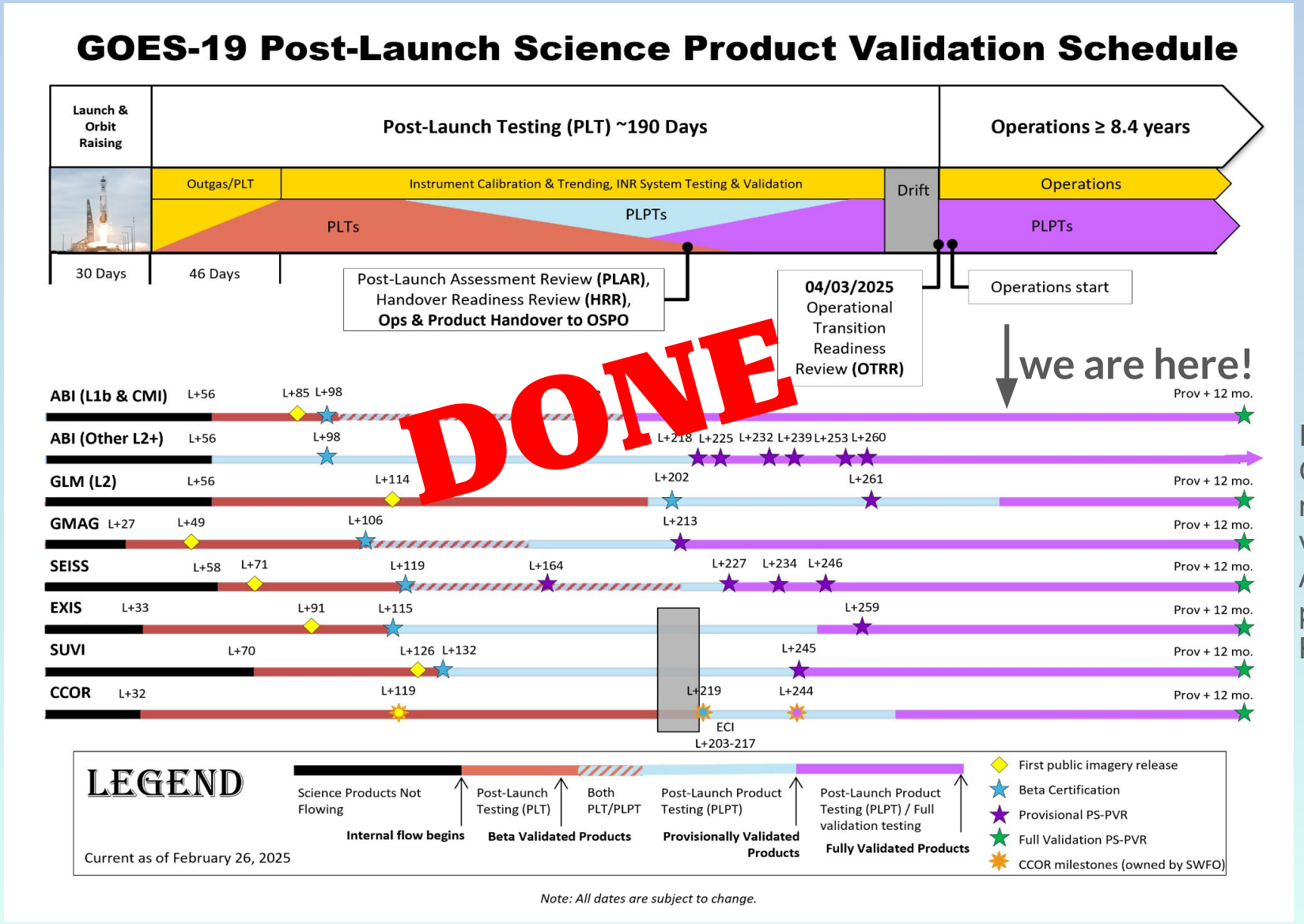
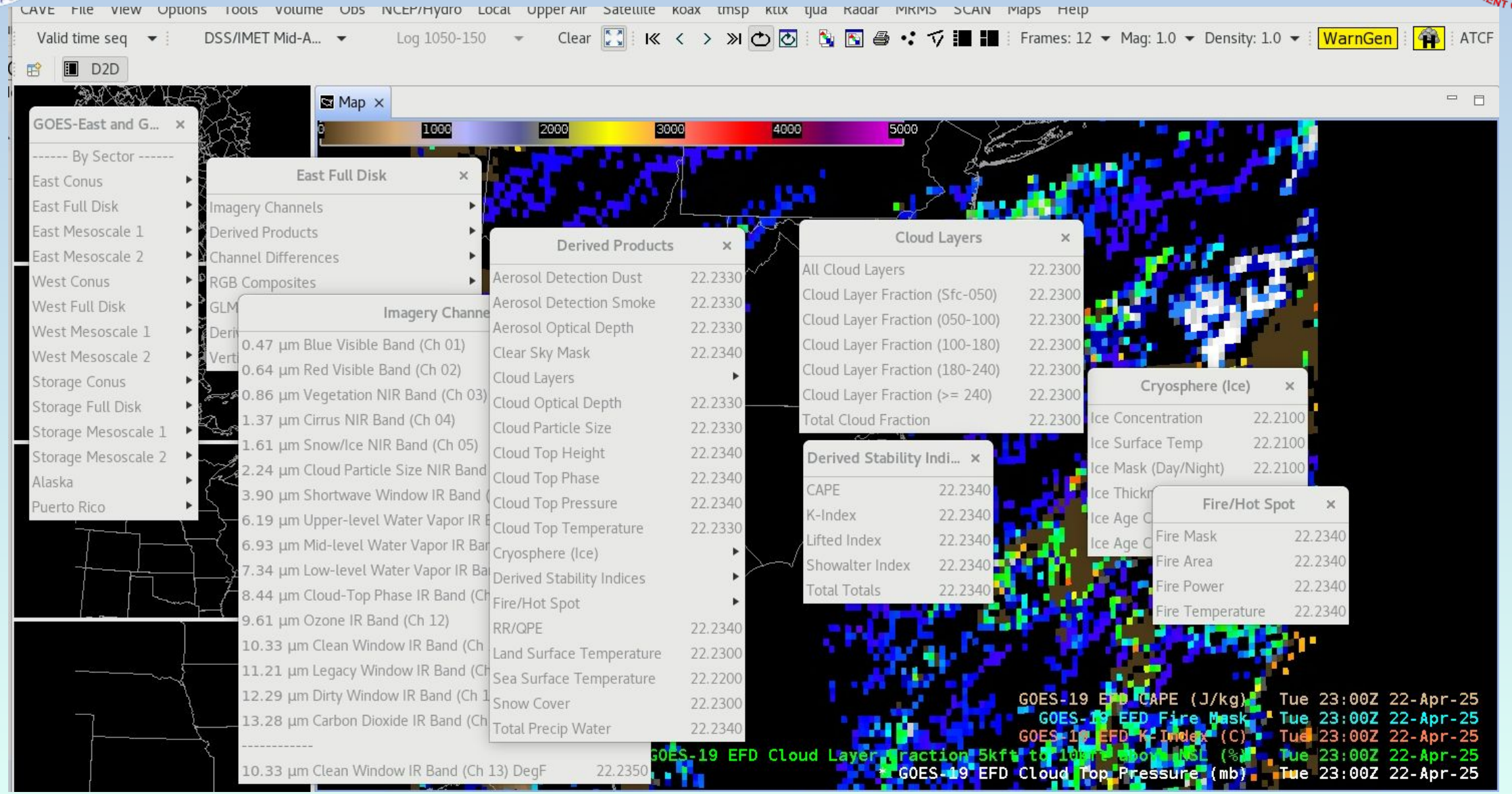
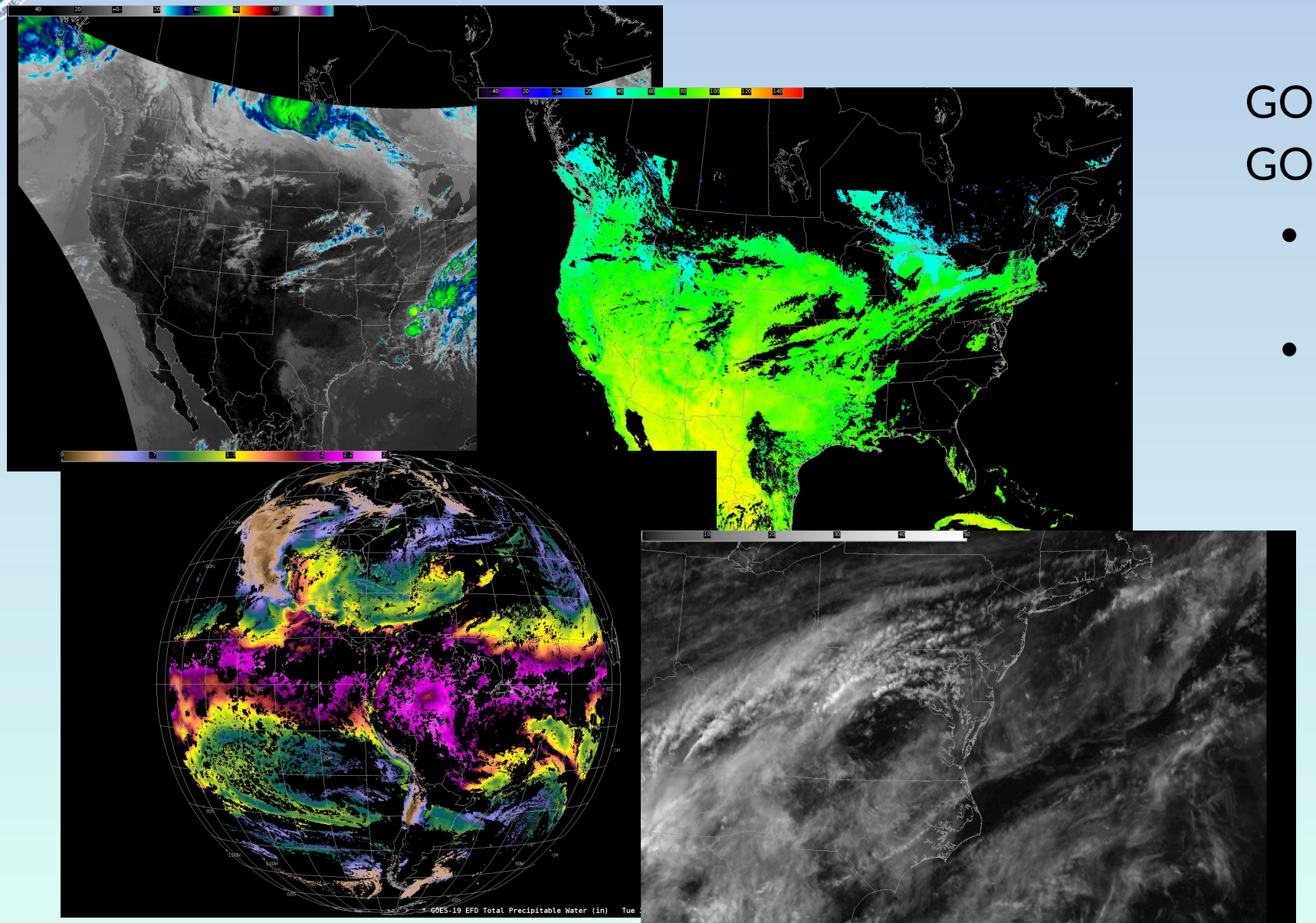


Image from GOES-R SPLASH meeting: TOWRS-S verified products in AWIPS and provided imagery for PS-PVR's

GOES-East Transition
Imagery and Derived Product Menus



GOES-East Transition



GOES-19 promoted to GOES-East April 7, 2025

- Post Operational checkout ongoing
- Carrying the new Compact Coronagraph (CCOR)

GOES-East Transition OT&E

- GOES-19 Operational Test and Evaluation (OT&E)
  - OT&E evaluates the proposed change(s) impact to Satellite operations while the GOES-19 products and imagery are used operationally
  - Specifically looking at SCMI, and L2 products (including GLM) that are delivered via SBN and GRB
  - Data Collection began on **4/14/2025**
    - OT&E Sites: AJK, APX, CAE, FWD, MFR, AWC, OPC, SPC
  - Data Collection will run through **5/16/2025**
  - One (1) Test Trouble Report (TTR) has been identified
    - In older versions of the TOWRPro 25 update, the Geocolor imaging is missing. This is not present in TOWRPro versions 25.8+.

TOWR-S Activities

TOWRpro v25 *(TOWR-S RPM v25 + APP)*

v25 is Available for all WFOs/RFCs

New products in AWIPS (see handout for more details) :

- Readies GOES-19 L2s & GLM
- ABI Flood Maps (Conus)
- OSCAT-3 winds (Pacific/Gulf/Atlantic, G Lakes)
- SAR winds (Pacific/Gulf/Atlantic, Great Lakes)
- Sofar drifting buoys (NWS NMP Pgm data-buy)
- GOES NGFS Fires

v25 AWIPS configuration changes include:

- New Gray color scale for the GOES Split Window Channel Difference
- Increase max range of NESDIS Snowfall rate in colormap/Style Rule
- GOES-19 Geocolor and L2s readied
- CIRA ALPW migration to SBN
- Improved display of NUCAPS soundings

v26 Planned Release Sept 2025, contents in work:

- Removal of Legacy GOES NOP Menu/configs
- GOES ProxyVis
- GMGSI Global geo composite metadata change
- GOES Color Vision Deficiency RGBs
- ALPW colormap range max at 1.5 (vs 3) inches

Current Status

As of April 25, 2025

	# Installed	Total # of Sites
Total:	136	149
AR Total:	4	5
CR Total:	41	41
ER Total:	25	26
PR Total:	2	3
SR Total:	40	42
WR Total:	23	28
RFC	10	13
RHQ	6	6
Test	2	3

Next steps: Assist sites who are updating their AWIPS to 23.4.x. They will need to update TOWRpro v25 to the 23.4.x compatible version

ISatSS on IDP Prod and Dev (College Park)

(IDP Satellite Support Subsystem)

Completed:

- IDP-Dev to IDP Ops transition v5.3 (Live beginning 4/1/2025):
  - OPC/SAB:
    - Incremental update to v5.2 deployed 09/24
    - GOES-19 ABI and GLM readiness [also to WPC]
    - Jason-3 processing updated for change to input file format
    - Updates LDM pqact rules to handle new prod ID format

- IDPDev:
  - SWOT, Cryosat-2, S3A/3B, Altika wave altimetry
  - GOES LightningCast [also to WPC]
  - SOFAR drifting buoys (NMP)
  - OSCAT Wind vectors
  - GOES RGBs for NAWIPS at OPC

In-work:

- H9/MSG Geo RGBs for NAWIPS at OPC
- MTG imagery tiles/area files evaluation
- SAR wind speeds
- GREMLIN radar emulation
- MW RGBs (AMSR2, GPM GMI, SSMIS) for WPC

Further reading: TOWR CCB Monthly

ISatSS at Remote National Centers

(IDP Satellite Support Subsystem)

Completed:

- NHC
  - GOES-19 ABI/L2 and GLM readiness
  - SWOT wave altimetry
  - GTWO Mosaic
  - SOFAR drifting buoys (NMP)
  - OSCAT-3 Winds (cloud only)
  - GREMLIN radar emulation (cloud only)

- AWC
  - GOES-19 ABI/L2 and GLM readiness
  - Global imagery mosaics
  - GREMLIN radar emulation
  - Mosaics (super-Conus, Alaska) (Jan 2025)

- SPC
  - GOES-19 ABI/L2 and GLM readiness

In-work:

- LightningCast for NHC
- OSCAT to NHC's NHCN (ops)
- Generate AWIPS imagery tiles for Meteosat Third Generation (MTG)

Further reading: TOWR CCB Monthly

SPADES

GOES-R Series Space Weather Products for SWPC

- SPADES v3.x deployed into IDP Operations 3/28/25
  - G19 functionality (excluding CCOR-1)
  - Reduction in latencies across all products
  - 3-month SWPC checkout
- Ongoing development activities
  - Containerizing services
  - Iterative L2 algorithm improvements and G19 coefficients

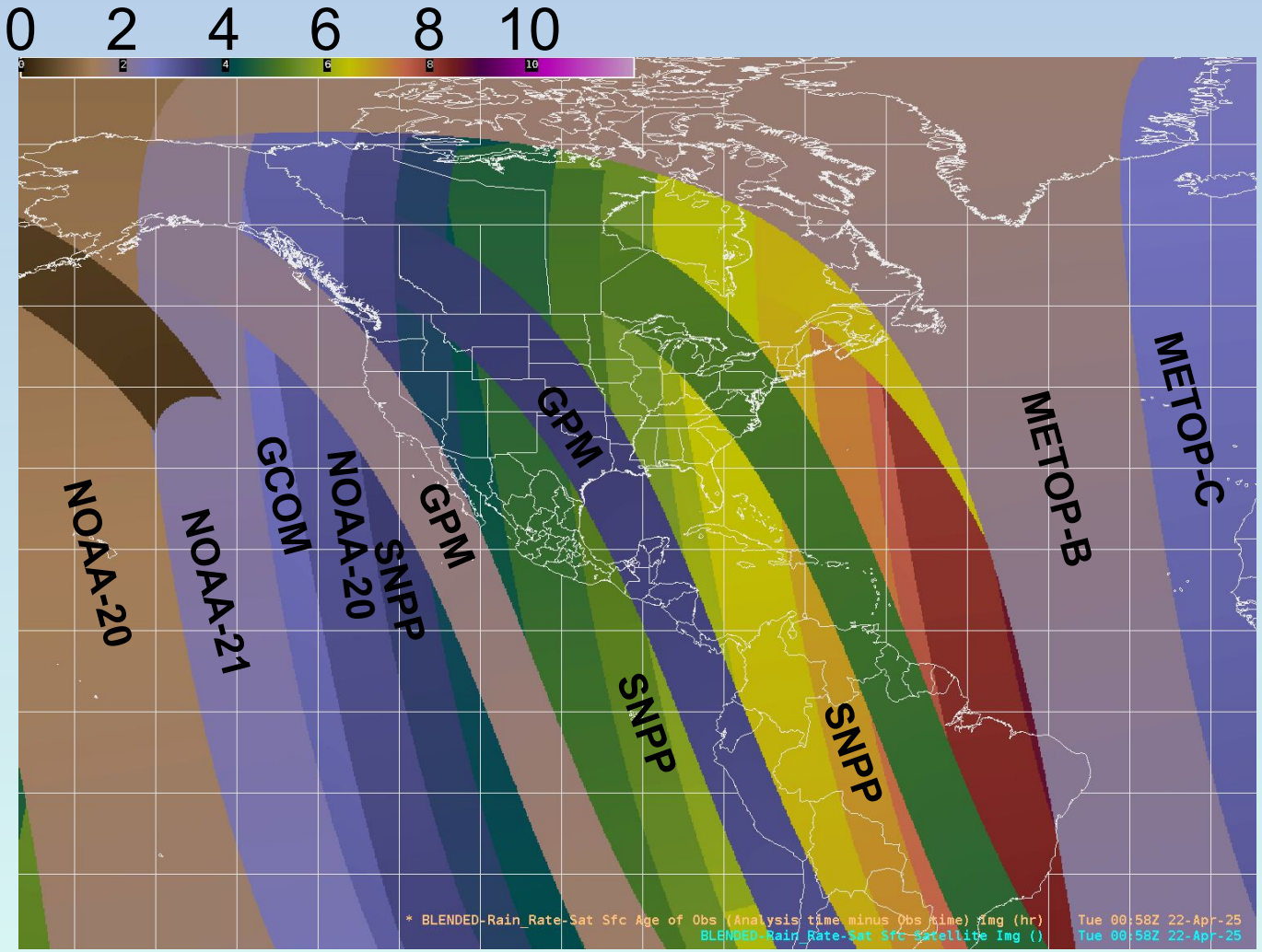
Recent satellite data products / changes

From OSPO: Legacy Data Source Retirements

Algorithms/Products	Data Source Retired or to be Retired	Existing Missions/Mitigation	Date of Retirement
MODIS Winds	Aqua/Terra	SNPP, N20, and N21 VPWs, Metop-B/C AVHRR Polar Winds	Jan 29, 2024
AVHRR Cloud Drift Polar Winds	NOAA 15/18/19	SNPP, N20 and N21 VPWs, Metop-B/C AVHRR Polar WInds	April 8, 2025
Microwave Integrated Retrieval System (MIRS)	NOAA 19, DMSP 17/18	SNPP and N20, N21 , Metop-B/C and GPM MIRS Products	April 8, 2025
***Blended Rain Rate & Blended TPW**	NOAA 19, DMSP 17/18 MIRS	SNPP, N20, N21, Metop-B/C, GPM, GCOM-W1	April 8, 2025
AMSU TC	NOAA 19 MIRS	MetOp-B/C AMSU	Feb 28, 2025
OMI SO2 Alert	Aura	OMPS SO2	Dec 2024
Ensemble Tropical Rainfall Potential (eTRaP)	NOAA 19, DMSP 17/18 MIRS	MetOp-B/C, GOES-19, GOES-18, METEOSAT-9/11, Himawari-8/9, S-NPP, NOAA-20, GCOM-W, GPM	April, 8 2025
Ocean Heat Content	SARAL	JASON-CS/MF Sentinel-6A Poseidon 4	Jan 15 2025

For details see https://www.ospo.noaa.gov/Products/retirements.html

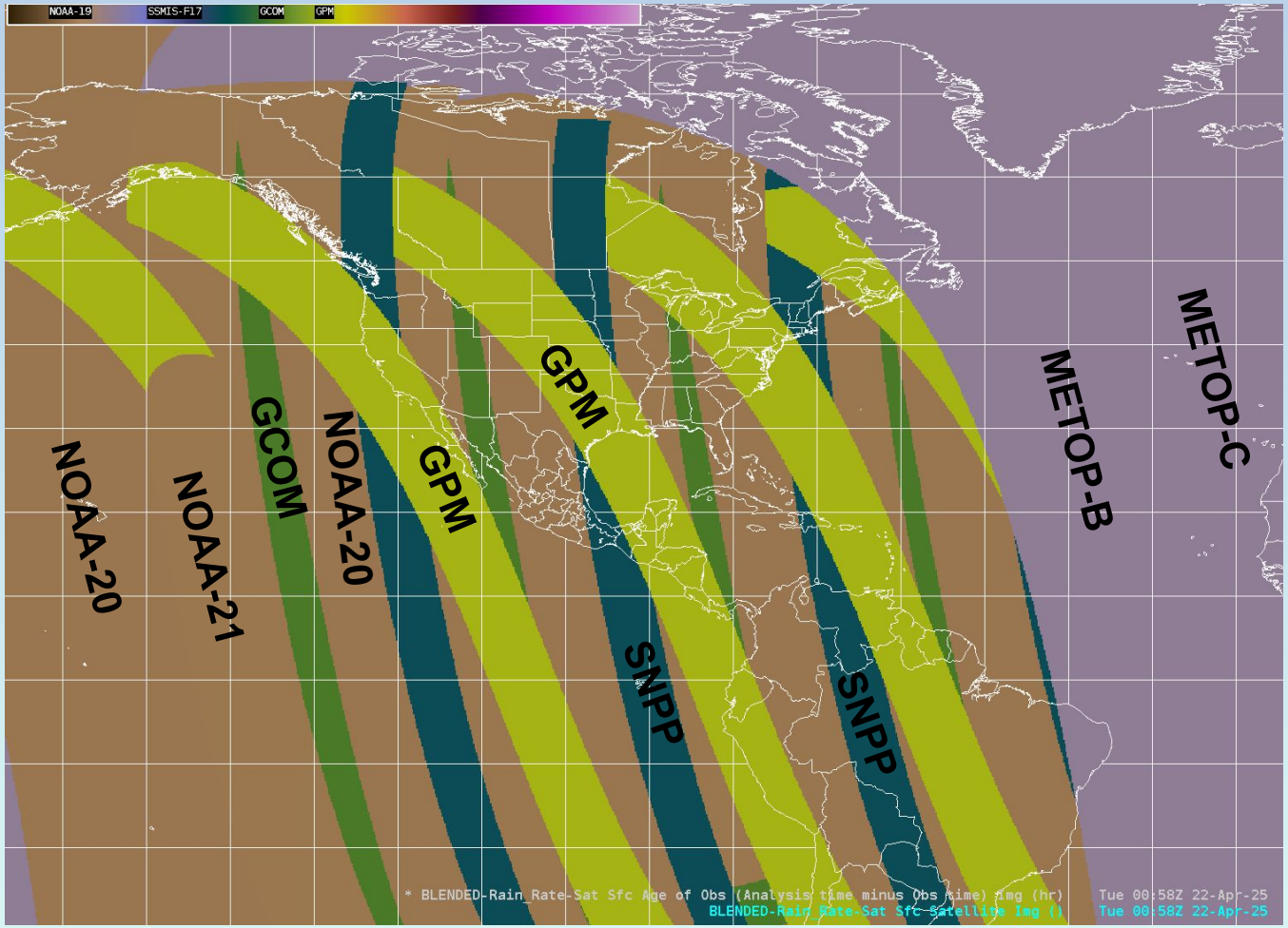
Polar Coverage: Blended Rain Rate



Blended Rain Rate Age

(hours)

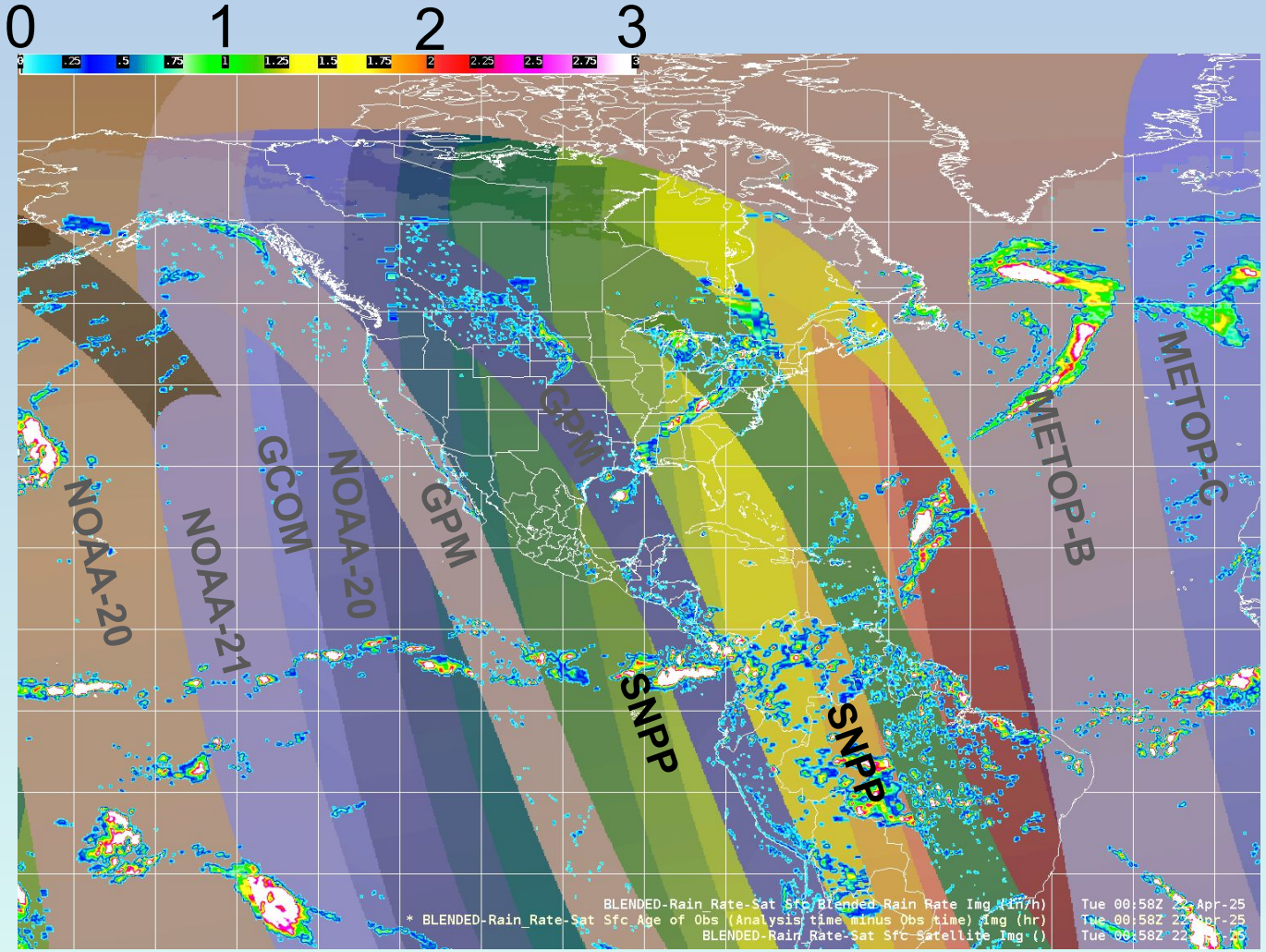
Polar Coverage: Blended Rain Rate



Blended Rain Rate Source*
NOAA-20, NOAA-21, Metop-B,METOP-C and others

*Requires an update to the legend to discriminate between the NOAA 20/21 and METOP B/C Satellites

Polar Coverage: Blended Rain Rate



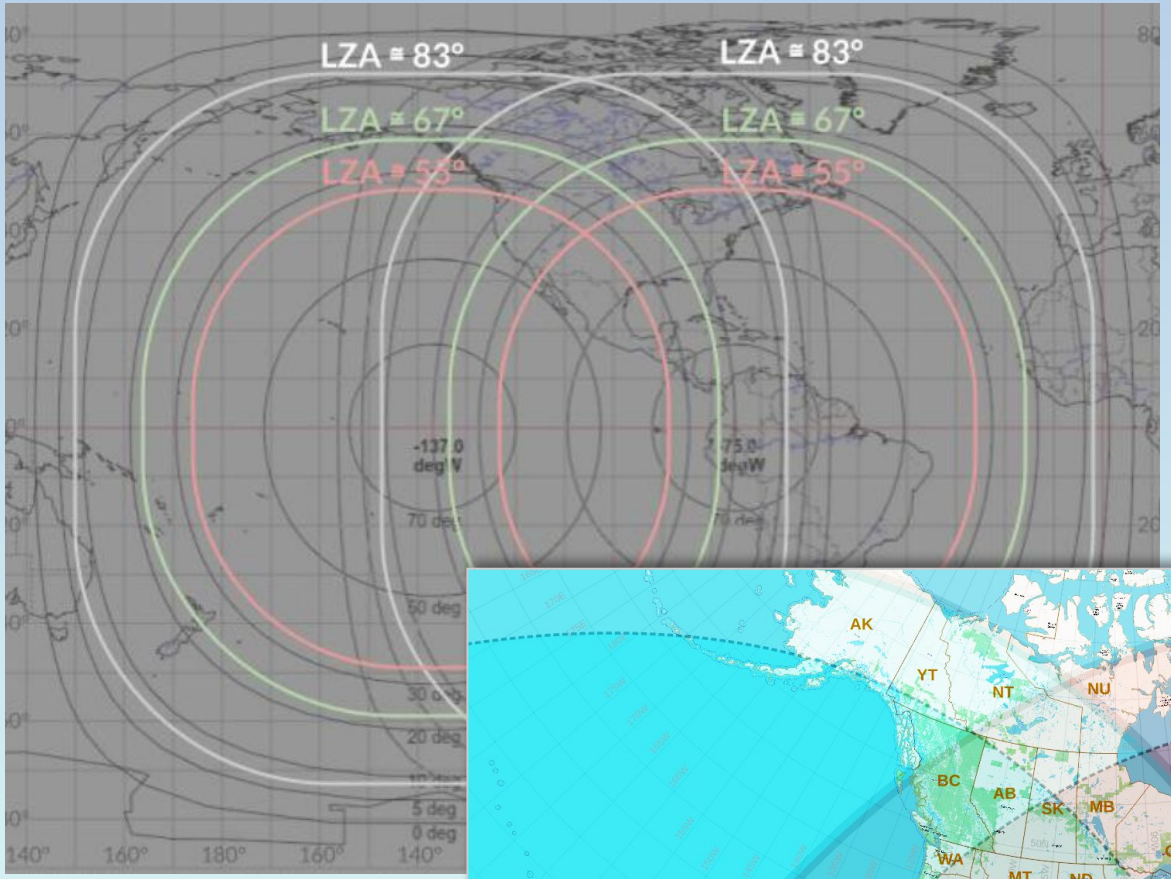
Blended Rain Rate

(in/hr)

GOES-R ASOS Satellite Cloud Products (SCP)

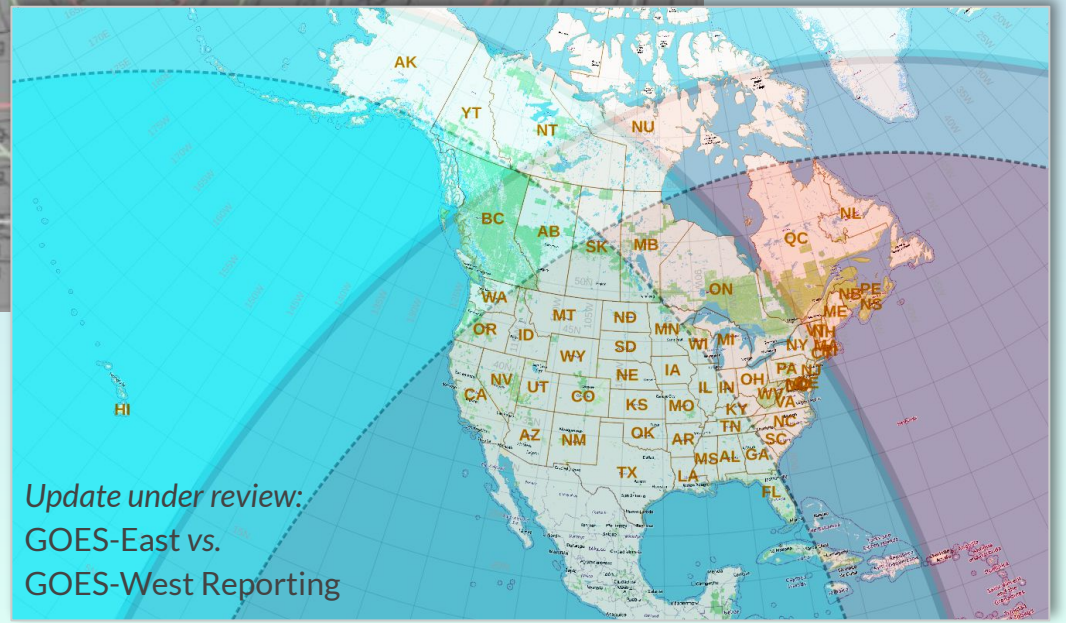
Routine updates will persist on a quarterly basis. Next update to be implemented week of 4/28/25.

Expected July 2025: update to algorithm resolving GOES-East vs. GOES-West false reportings over New England states



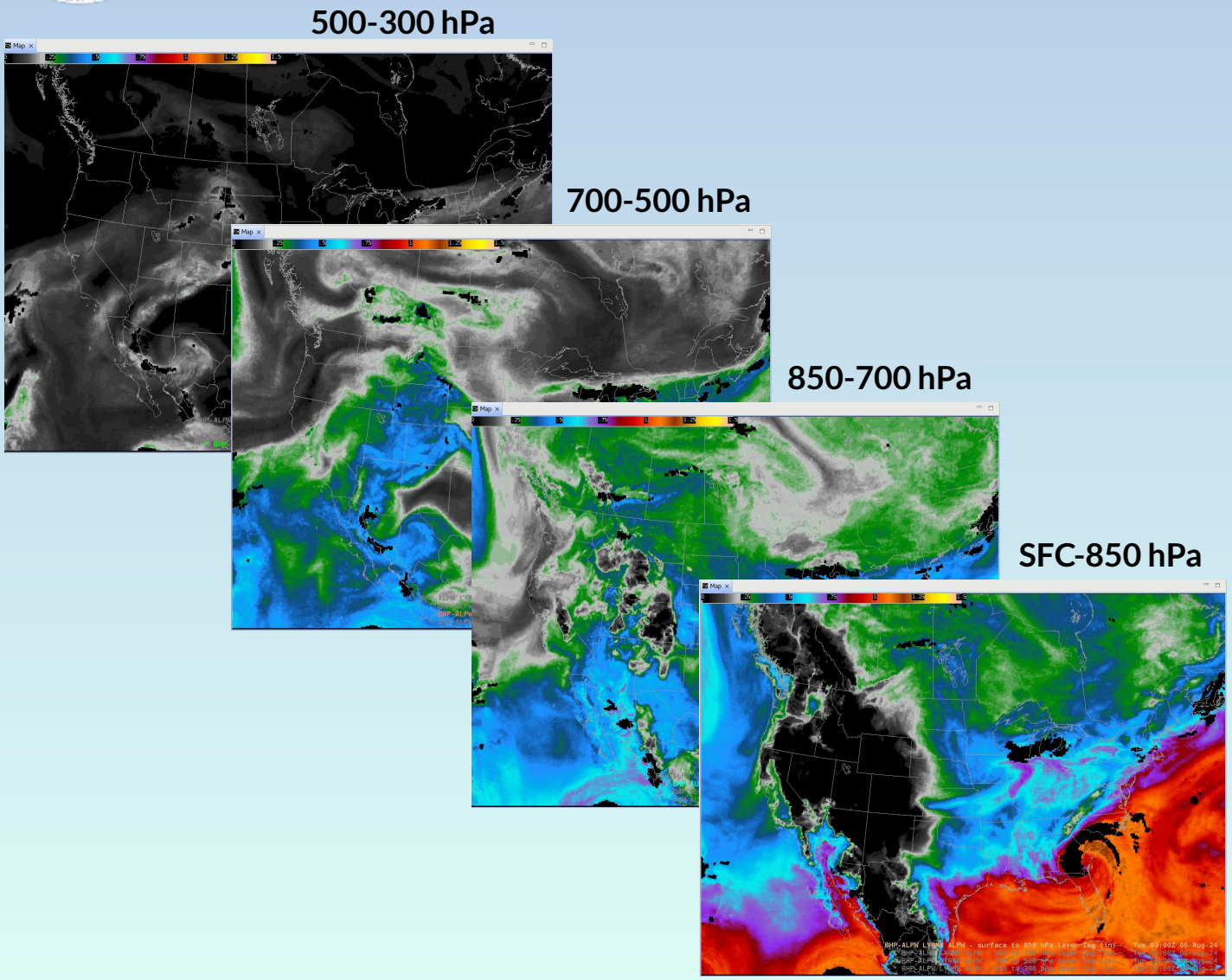
GOES-R ASOS SCP station locations have been synced with the AWIPS National Datasets Maintenance (NDM) repository on VLab:

NOAA community may request station changes directly at https://vlab.noaa.gov/redmine/projects/awips-ndm/



Update under review:
GOES-East *vs.*
GOES-West Reporting

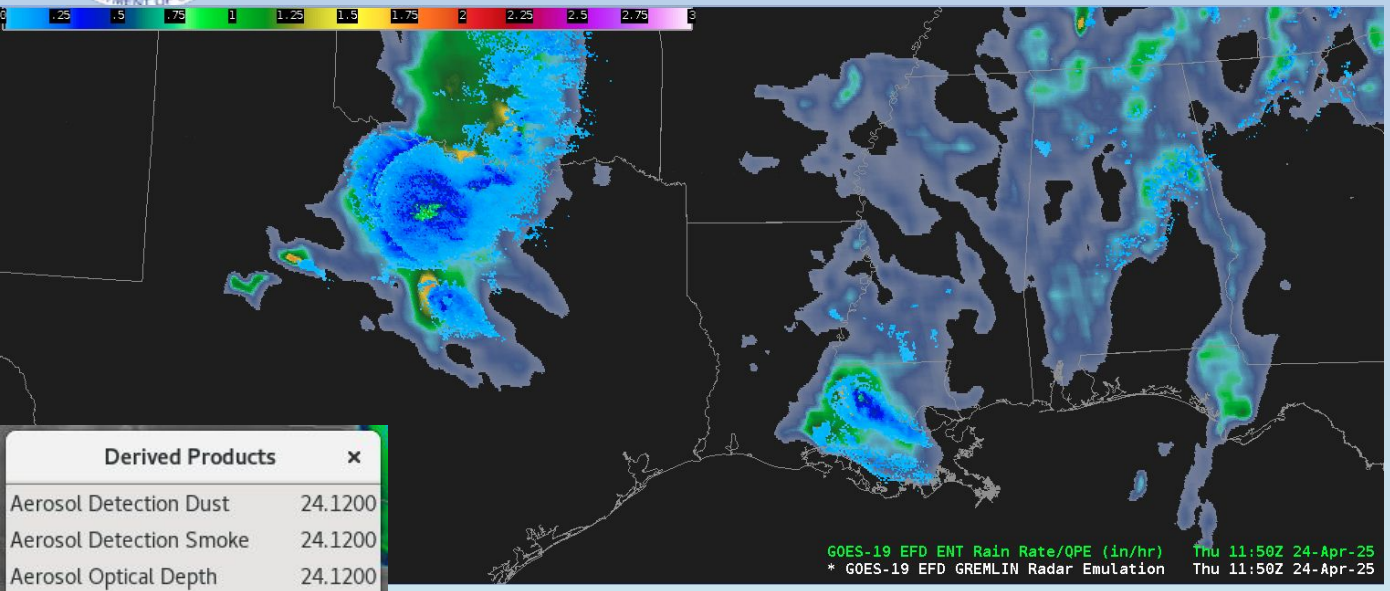
Advected Layered Precipitable Water (ALPW) Promoted to Operations

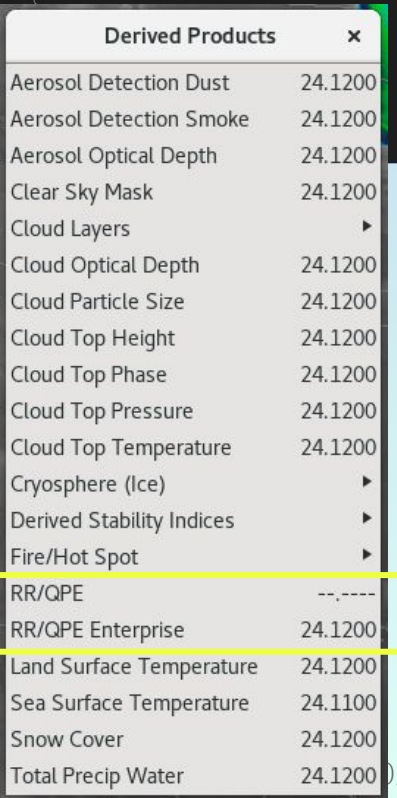


ALPW

- RC/CM approvals late 2024
- Supported in TOWRpro v25
- SCN released on 01/13/25
- Flow over SBN as of 03/28/25, replacing the current product flowing over regional LDM
- ALPW @CIRA

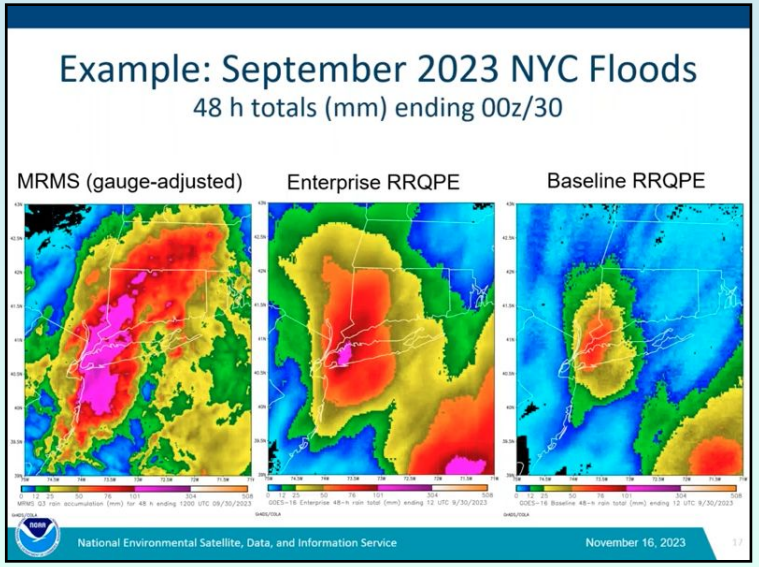
Enterprise Rain Rate Promoted to Operations





Rain Rate

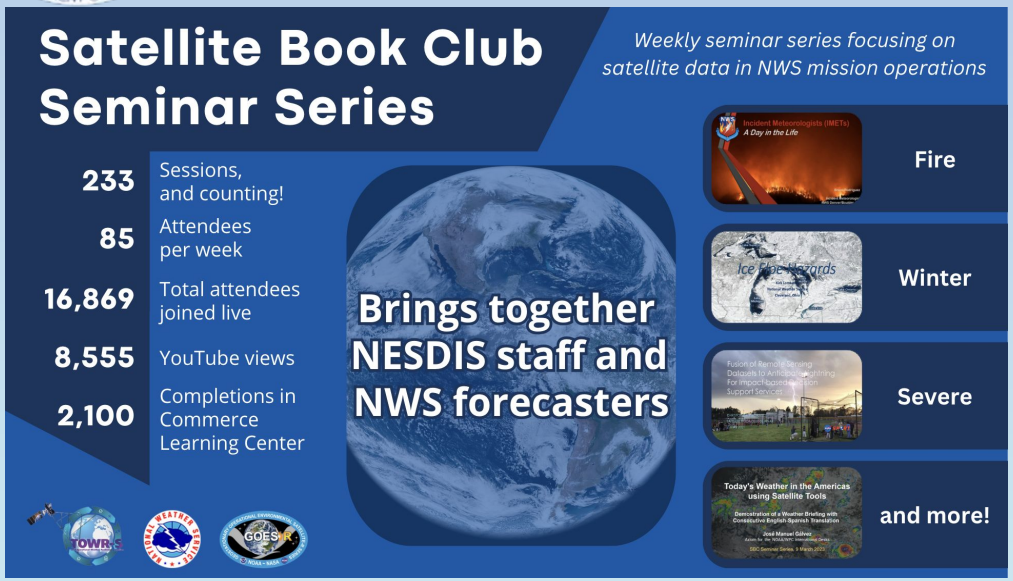
- SCN released on 01/31/25
- Activated 03/03/25
- Supported in TOWRpro v25
- GOES-19 data moved to the Enterprise Rain Rate on 04/23/25 (previously pointing to the legacy algorithm)

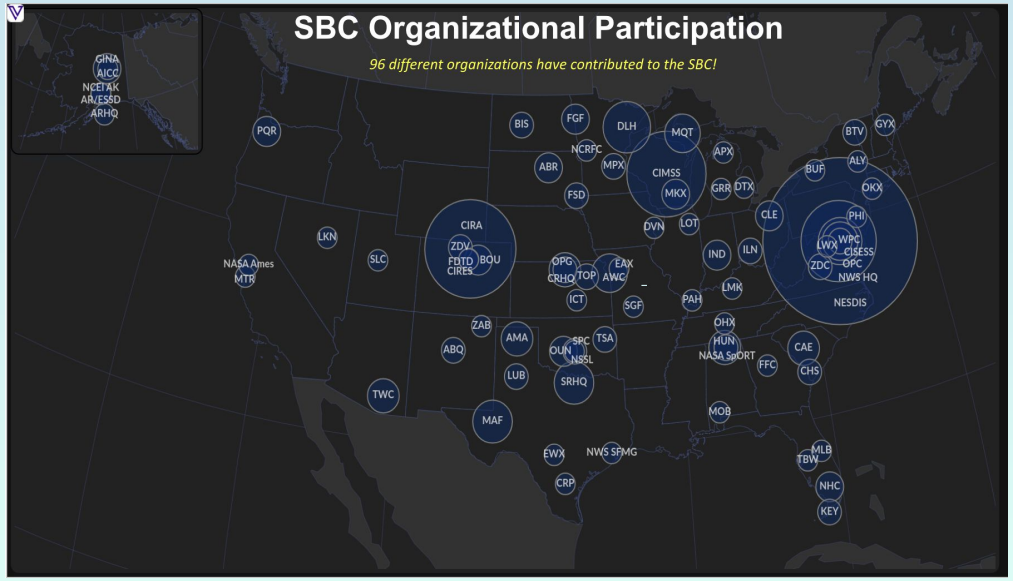


(Screenshot from Dr. Bob Kuligowski's Satellite Book Club presentation)

Documentation / Communication / Outreach

Satellite Book Club (SBC) Seminar Series





Session Details:

- Thursdays at Noon ET
- Recordings are on YouTube and the NWS Commerce Learning Center (CLC) website
- SBC videos are searchable by keyword

Upcoming Sessions:

May 1: Matthew Mahalik | Toward a Fire-Ready Nation

May 8: Randy Graham | Remote Mesoanalysis Support - Revolutionizing Severe Weather Operations through Mutual Aid

May 15: Keith Sherburn | Remote Mesoanalysis (RMA) Applications of Satellite Imagery

May 22: Katie Magee and Becca Darish | Mesoanalysis Informed Messaging and Post-Event Imagery Techniques for the May 8-9th Tornado Event

May 29: Brian LaSorsa | Twisters: A Meteorological Study of the June 5, 2024 Outbreak in eastern West Virginia, northern Virginia, and Maryland

Return to overview

TOWR-S Product Baseline

TOWR-S PRODUCT BASELINE

The Product Baseline lists the products serviced by the TOWR-S Team, available to the National Weather Service. Not all products are available at all NWS sites, or on all NWS systems.

Search:

Product Name	Satellite	Sensor	Geophysical Domain	Parameter	Sector (Refresh Rate)	Distribution Path	Distribution Source	WMO Header
88GHz Qv Imagery	SNPP/NOAA-20	ATMS	Foundational	Imagery	Granules (90 min)	IDP ISatSS -> OPC/SAB	PDA	N/A
ABI Flood Maps	GOES East/West	ABI	Land	River Ice & Flooding	Regional Mosaics (1 hr)	Regional LDM	PDA/AWC	N/A
Advected Layer Precipitable Water	Blended Hydro Suite	Blended Hydro Suite	Atmosphere	Advected Layer Precipitable Water	Global (1 hr)	SBN EXP	PDA	TICY70 KNES
Aerosol Detection	GOES East/West	ABI	Atmosphere	Aerosols	Full Disk (10 min), CONUS (10 min), Mesoscale (5 min)	SBN EXP	PDA	IXTA[89]9 KNES
Aerosol Detection	SNPP/NOAA-20	VIIRS	Atmosphere	Aerosols	Granules (10 hr)	TBD	PDA	N/A
Aerosol Optical Depth	GOES East/West	ABI	Atmosphere	Aerosols	Full Disk (10 min), CONUS (5 min)	SBN EXP	PDA	IXTB[89]9 KNES
Aerosol Optical Depth	SNPP/NOAA-20	VIIRS	Atmosphere	Aerosols	Granules (10 hr)	TBD	PDA	N/A

Showing 1 to 92 of 92 entries

Table of all satellite data products that we are involved with integrating into NWS forecast operations.

Search, sort, filter

Many rows link to Dataset Guides with AWIPS details.

Note: Distribution Path "TBD" indicates a product not yet disseminated to users

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

TOWR-S Product Baseline

Graphic overview (Geophysical themes + Instrument sources)

Atmosphere

Aerosols
- ABI Aerosol Detection; Aerosol Optical Depth
- VIIRS Aerosol Detection; Optical Depth; Volcanic Ash

Cloud Liquid Water
- ATMS/CrIS MiRS CLW
- AMSR2-OCEAN

Convection
- ABI Derived Stability Indices

Derived Motion Winds
- ABI DMW
- Himawari AHI DMW
- VIIRS DMW

Fog & Low Stratus
- ABI FLS

Lightning
- GLM Flash Extent Density; Minimum Flash Area

Profiles
- ABI Soundings (Legacy Vertical Moisture Profile; Legacy Vertical Temperature Profile)
- ATMS/CrIS NUCAPS
- Metop B/C GOME-2 NUCAPS

Rain Rate/Qualitative Precipitation Estimation
- ABI RR/QPE; Global Hydro-Estimator
- AMSR2-OCEAN; AMSR2-PRECIP
- ATMS/CrIS MiRS RR
- Blended Hydro Suite RR
- Himawari AHI RR/QPE

Total Precipitable Water
- ABI TPW
- AMSR2-OCEAN
- ATMS/CrIS MiRS TPW
- Blended Hydro Suite TPW; %TPW

Turbulence
- ABI CIMSS Turbulence

Clouds

Cloud Layers
- ABI Cloud Cover Layers

Cloud Mask
- ABI Cloud Mask
- Himawari AHI Clear Sky Mask
- VIIRS Cloud Mask

Cloud Optical Depth
- ABI Cloud Optical Depth
- Himawari AHI Cloud Optical Depth
- VIIRS Cloud Optical Depth

Cloud Particle Size
- ABI Cloud Particle Size

Cloud Phase
- ABI Cloud Phase
- Himawari AHI Cloud Top Phase
- VIIRS Cloud Phase

Cloud Top Height
- ABI Cloud Top Height
- Himawari AHI Cloud Top Height
- VIIRS Cloud Top Height

Cloud Top Pressure
- ABI Cloud Top Pressure
- Himawari AHI Cloud Top Pressure
- VIIRS Cloud Top Pressure

Cloud Top Temperature
- ABI Cloud Top Temperature
- Himawari AHI Cloud Top Temperature
- VIIRS Cloud Top Temperature

Sky Cover
- ABI ASOS SCP

Land

Fires
- ABI Fire Hot Spot
- VIIRS Active Fires

Land Surface Temperature
- ABI LST
- VIIRS LST

River Ice & Flooding
- ABI Flood Maps
- VIIRS Flood Mapping

Soil Moisture
- AMSR2-SOIL

Ocean

Altimetry
- Cryosat-2 SIRAL Wave Altimetry
- JASON-3 Wave Altimetry
- Sentinel-3A/B SRAL Wave Altimetry
- Sentinel-6A Poseidon-4 Wave Altimetry

Sea Surface Temperature
- ABI SST
- AMSR2-OCEAN SST
- Himawari AHI ACSPO SST
- VIIRS ACSPO SST

Sea Surface Winds
- AMSR2-OCEAN Winds
- Cryosat-2 SIRAL Winds
- JASON-3 Winds
- Metop B/C ASCAT Winds
- OSCAT-3 Winds
- Sentinel-3A/B SRAL Winds

Cryosphere

Ice Age, Concentration, Thickness
- ABI Ice Age & Thickness
- ABI Ice Concentration & Extent
- AMSR2-SEAICE-NH
- ATMS/CrIS MiRS Ice
- VIIRS Ice Age, Concentration, Thickness

Snow Cover
- ABI Snow
- AMSR2-SNOW
- ATMS/CrIS MiRS Snow
- VIIRS Snow Cover

Foundational

Imagery
- 5 Geo Comp GMGSI Longwave IR; Visible; Water Vapor
- ABI SCMI Tiles
- AMSR2-MBT
- ATMS 88GHz Qv Imagery
- GPM GMI Microwave Imagery
- Himawari AHI Imagery
- SEVIRI VIS/IR/SWIR/WV
- SSMIS Microwave Imagery
- VIIRS Img.EDRs

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

Other VLab Resources

Search:

RGB Name	Use Case	Simple/ Adv./Old	Bands															Channel Differences											
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	5-2	7-13	8-10	9-10	10-8	12-13	13-7	13-11	14-11	15-13	Other
Air Mass	Inferring cyclogenesis; Identifying air masses	A								xd		d		d	d						x			x					
Ash	Ash detection; SO2 identification	A											d		xd	d	d										x	x	
CIMSS Natural Color	Human perspective from space	A	x	x																									x
CIRA Geocolor	Human perspective from space	A	x	x	x				d						xd										x				x
Day Cloud Convection	High convection clouds, low-mid water clouds, land surface distinction	S		xx											x														
Day Cloud Phase	Convective initiation; Snow squalls	S		x			x								x														

Showing 1 to 24 of 24 entries

x = included xx = two colors from same band included d = included in a channel difference xd = included as both a single band and channel difference

Table of GOES RGBs with Quick Guides, Use Cases and Bands

Table of GOES L2 products on the SBN with WMO Headers and PDA Shortnames

GOES-R L2 Products on SBN

The table below lists the GOES-R L2 products that are available via NOAAPort (Satellite Broadcast Network)

Search:

WMO Headers (East)	WMO Headers (West)	Product	PDA Shortname: Full Disk	PDA Shortname: CONUS	PDA Shortname: Meso1,2
IXTA99 KNES	IXTA89 KNES	Aerosol Detection	ABI_L2_ADPF	ABI_L2_ADPC	ABI_L2_ADPM
IXTB99 KNES	IXTB89 KNES	Aerosol Optical Depth	ABI_L2_AODF	ABI_L2_AODC	
IXTC99 KNES	IXTC89 KNES	Cloud Cover Layers	ABI_L2_CCLF	ABI_L2_CCLC	ABI_L2_CCLM
IXTD99 KNES	IXTD89 KNES	Cloud Top Phase	ABI_L2_CTPF	ABI_L2_CTPC	
IXTE99 KNES	IXTE89 KNES	Fog & Low Stratus		ABI_L2_GFLSC_AWIPS	
IXTF99 KNES	IXTF89 KNES	Rain Rate / Quant. Precip. Est.	ABI_L2_RRQPEF		
IXTG99 KNES	IXTG89 KNES	Cloud Top Height	ABI_L2_ACHAF	ABI_L2_ACHAC	ABI_L2_ACHAM
IXTH99 KNES	IXTH89 KNES	Cloud Mask	ABI_L2_ACMF		ABI_L2_ACMM
IXTI99 KNES	IXTI89 KNES	Cloud Top Temperature	ABI_L2_ACHTF	ABI_L2_ACMC	ABI_L2_ACHTM
IXTJ99 KNES	IXTJ89 KNES	Fire Detection	ABI_L2_FDCF	ABI_L2_FDCC	ABI_L2_FDCM

Showing 1 to 23 of 23 entries

https://vlab.noaa.gov/web/towr-s/datasets

TOWR-S Newsletter

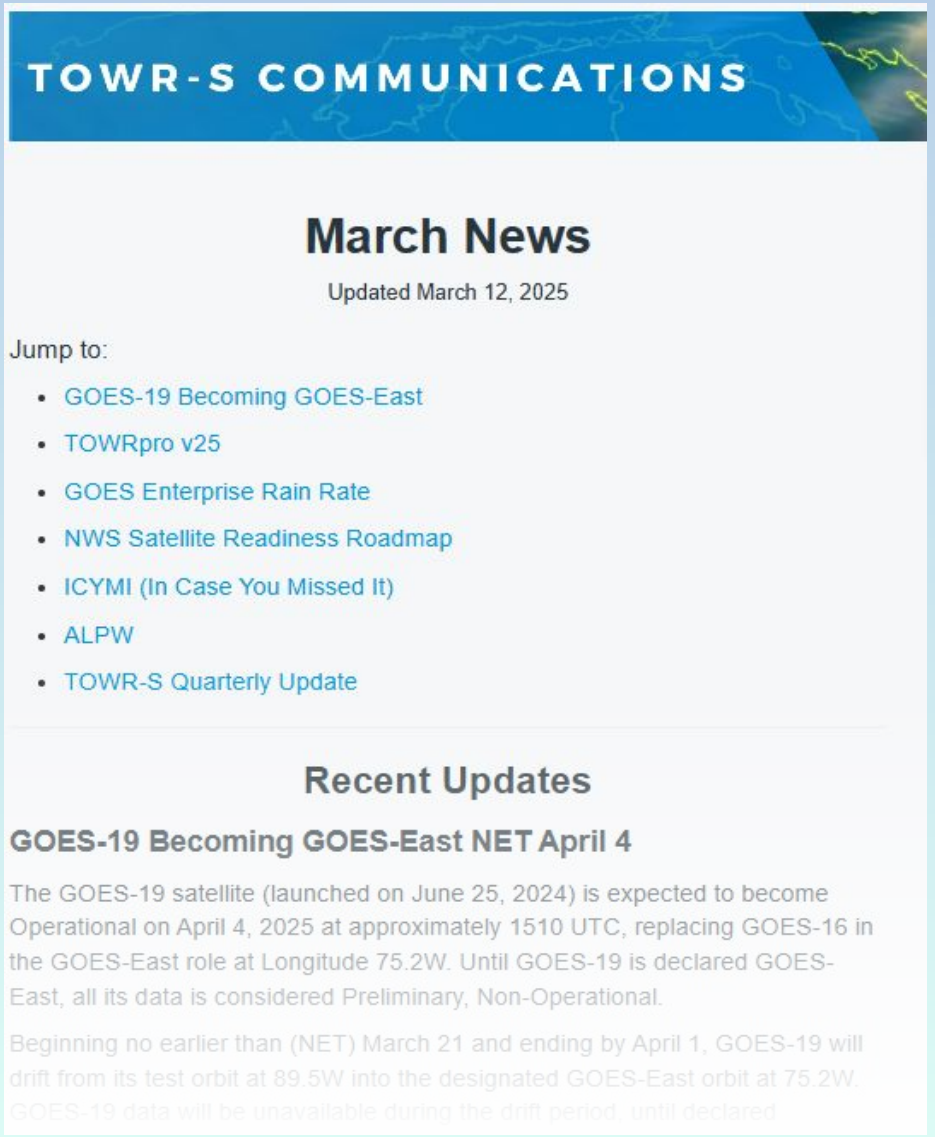
Supplements these quarterly TOWR-S Update briefings.

Keep an eye out for the May edition!

Emailed to TOWR-S Update attendees, SOOs, stakeholders, and posted to VLab. (https://vlab.noaa.gov/web/towr-s/communications)

Over 640 recipients - subscribe here

Comes out 1st or 2nd week of the month



TOWR-S COMMUNICATIONS

March News

Updated March 12, 2025

Jump to:

- GOES-19 Becoming GOES-East
- TOWRpro v25
- GOES Enterprise Rain Rate
- NWS Satellite Readiness Roadmap
- ICYMI (In Case You Missed It)
- ALPW
- TOWR-S Quarterly Update

Recent Updates

GOES-19 Becoming GOES-East NET April 4

The GOES-19 satellite (launched on June 25, 2024) is expected to become Operational on April 4, 2025 at approximately 1510 UTC, replacing GOES-16 in the GOES-East role at Longitude 75.2W. Until GOES-19 is declared GOES-East, all its data is considered Preliminary, Non-Operational.

Beginning no earlier than (NET) March 21 and ending by April 1, GOES-19 will drift from its test orbit at 89.5W into the designated GOES-East orbit at 75.2W. GOES-19 data will be unavailable during the drift period, until declared

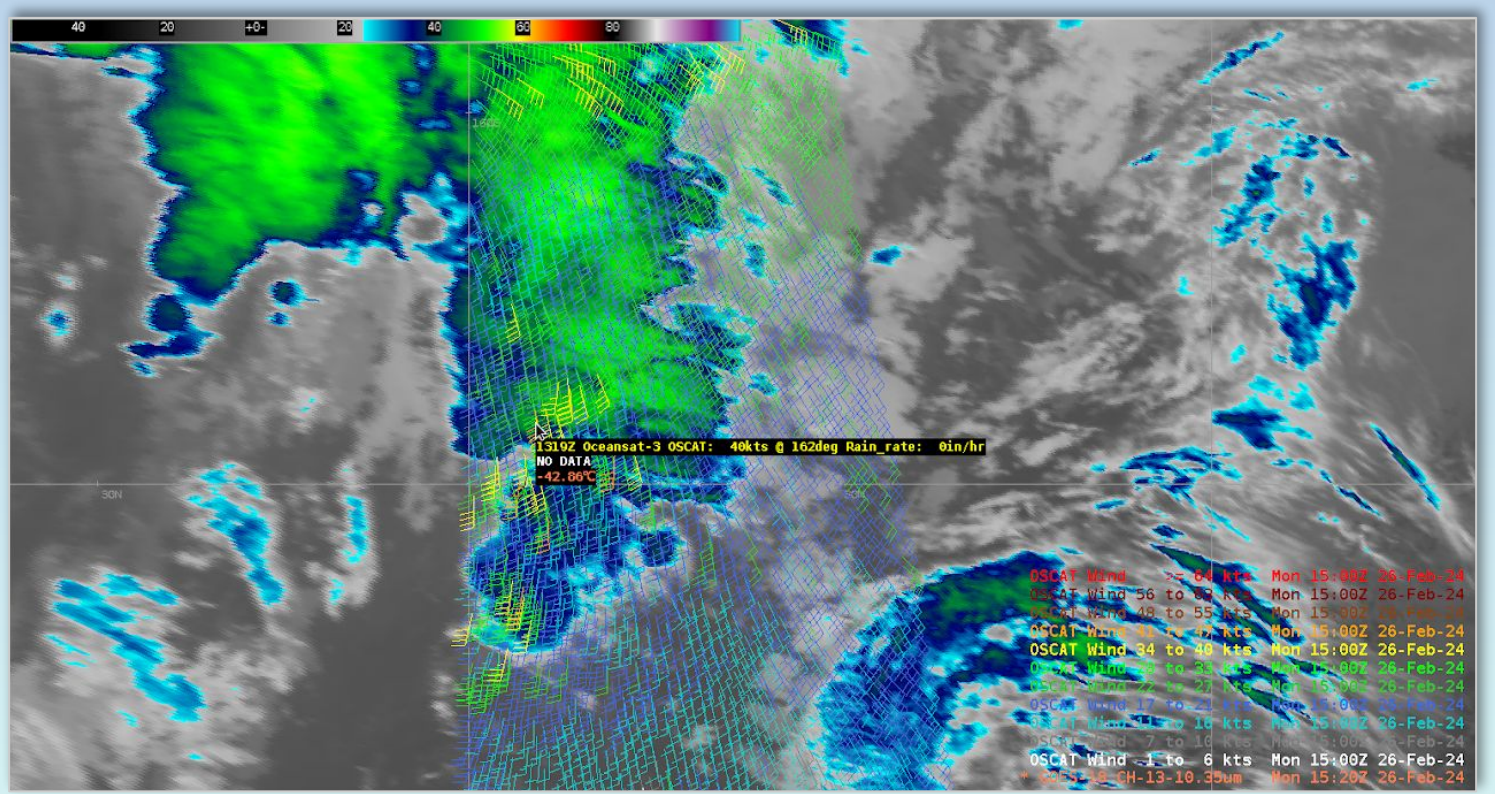
Return to overview

Upcoming satellites / products

TOWR-S 2025 Tasks/Planning

- GPM precipitation products for Alaska (resumption of GPROF)
- OSCAT
- MeteoSat Third Generation
- Metop-SG
- Lightning Cast
- QuickSounder
- OCTANE

OSCAT-3 scatterometer winds



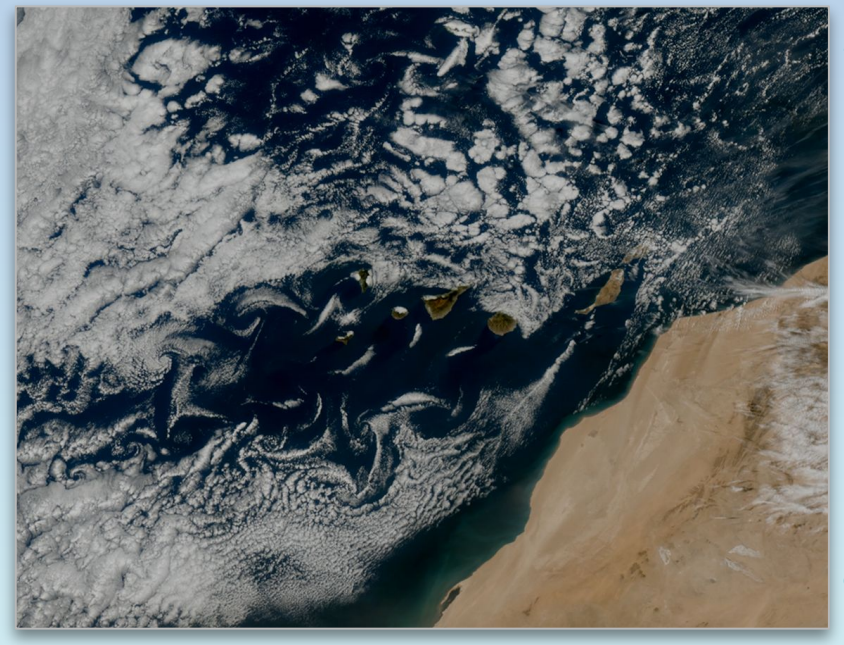
OceanSat-3 / OSCAT-3

- L2 Ocean Surface Winds files from the OSCAT-3 scatterometer are now ready for AWIPS
- This product fills the gap left when SCATSAT ceased operating in Feb. 2021.
- **Dev-ops data flow and AWIPS configuration are included in TOWRpro v25**
- TOWRpro allows for access from the OSCAT3 Lite website, and also will handle operational data when available
- 51 WFOs/RFCs are currently pulling in the product, sourced from NESDIS/STAR, via v25
- **Scheduled for Summer 2025 NCCF operational release**

MeteoSat 3rd Generation

- MeteoSat 3rd Generation (MTG-Imager1) launched Dec. 2022
  - Key instruments: **Lightning Imager** and **Flexible Combined Imager**
- MTG-I1 data availability schedule: *(updated Sept 5, 2024)*

Central facility MTG data release	Data type	Delivery mechanism	Accessible for
24 Sept 2024	**Flexible Combined Imager L1c** data - continuous feed (compressed via EUMETCast)	EUMETCast Data Store EUMETView	Pre-operational release to all users
To be announced *(for details see footnote at MTG-I1 data availability schedule)*	**Flexible Combined Imager L2** data – continuous feed of a subset of products		
28 Mar 2024	**Lightning Imager** data - subset of groups and flashes	Open sftp	All users
8 July 2024	**Lightning Imager** data - continuous feed of all products	EUMETCast Data Store	Pre-operational release to all users



MTG-I1 view of Canary Islands (Mar. 18, 2023)

https://www.eumetsat.int/features/discover-first-images-mtg-i1

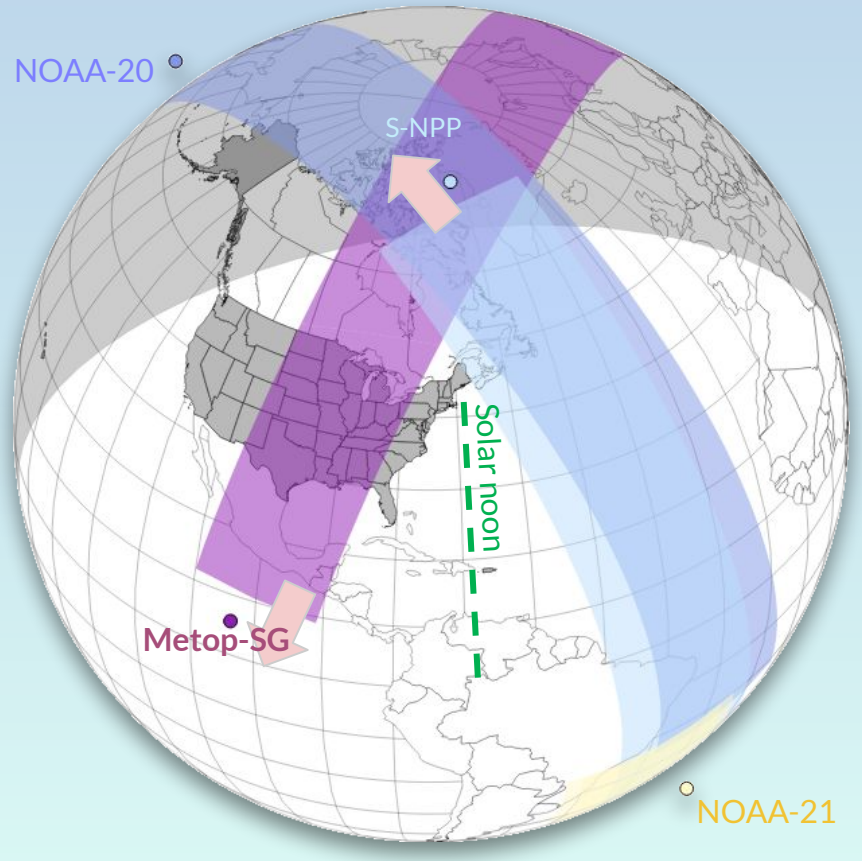
- MTG-I1's Flexible Combined Imager (FCI) resumed observations in May, but lost on-board calibration capabilities and redundancy.
- MTG-I1 will be referred to as Met-12 when declared operational
- Public Release of Pre-Operational MTG-I1 FCI data
- Working w/ STAR-provided data to prepare AWIPS-ready tiles
- Coordinating access via NCCF

July-Sept. 2025: **launch of MTG-Sounder1**

Further reading:
https://www.eumetsat.int/planned-launches

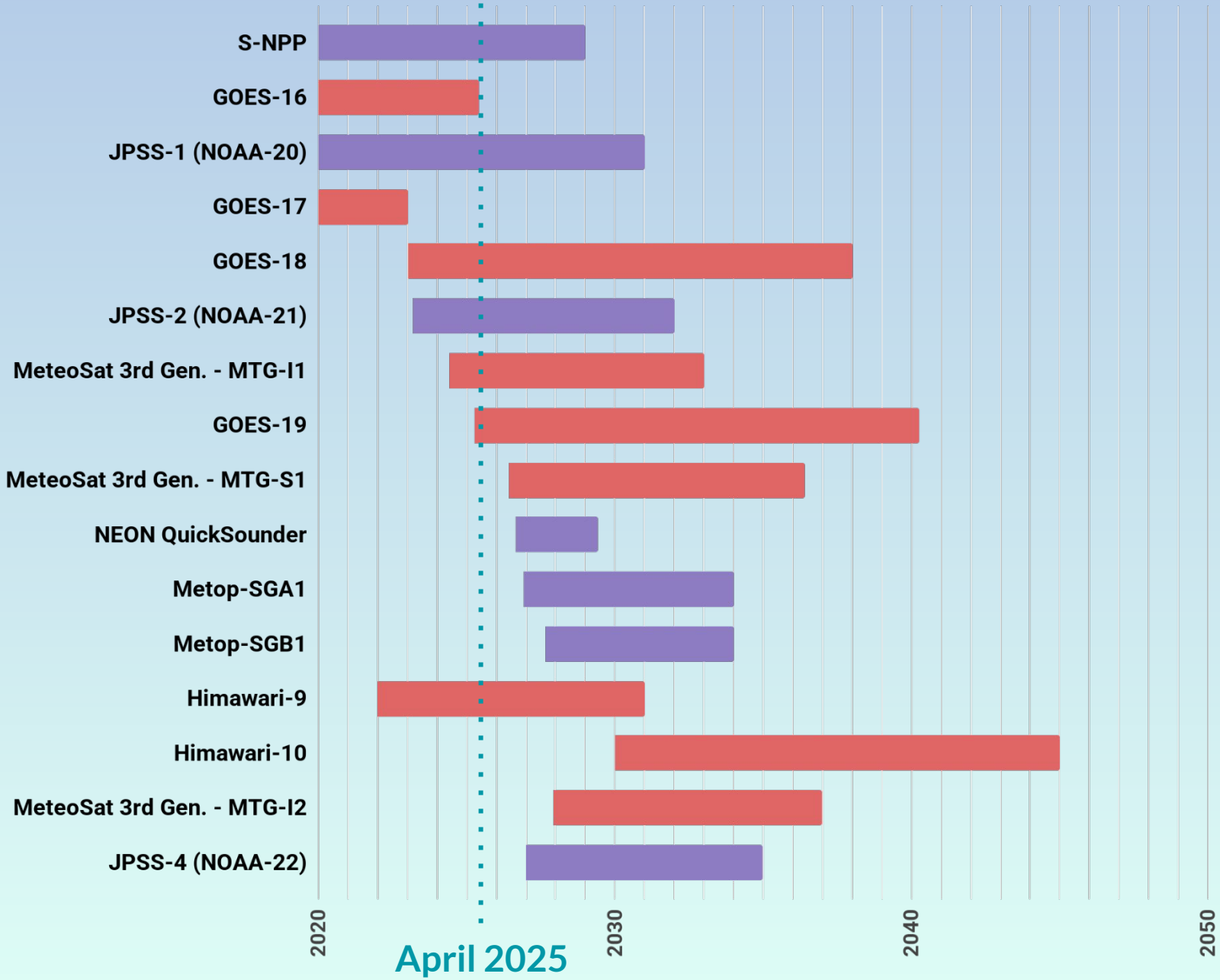
Metop-Second Generation (Metop-SG)

- Metop-SG A1 to launch Aug 2025; Metop-SG B1 in June-Aug 2026
  - A-B tandem pairs in sun-synchronous polar (morning) orbit
  - Key instruments aboard A (sorted by importance to NWS forecaster):
    - **METimage: Meteorological Imager**
    - **IASI-NG: Infrared Atmospheric Sounder Interferometer - New Generation**
    - **MWS: Microwave Sounder**
    - **Sentinel-5 UVNS**: Ultra-violet, Visible and Near-infrared Sounder
    - **3MI**: Multi-viewing Multi-channel Multi-polarisation Imager
    - **RO**: Radio Occultation sounder
- Key instruments aboard B:
  - **MWI: Microwave Imager**
  - **SCA: Scatterometer**
  - **ICI**: Ice Cloud Imager
  - **RO**: Radio Occultation sounder
  - TOWR-S completed Version 1.2 NWS User Readiness Plan for Metop-SG



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

Operational Schedule of Key Satellites



LEO

GEO

Road to GeoXO, NEON, Space Weather

FY 24-25

- ☆ Outlining the roadmap - working across NWS orgs (and with NESDIS) on satellite-oriented integrated planning
- ☆ Survey existing infrastructure, data and exploitation, identify gaps and develop plans to fill them
- ☆ Identify prospective Pilots and Pathfinders
- ☆ NWS infrastructure projects continue (e.g., AWIPS-in-Cloud)

FY 26-28

- ☆ Develop and mature NWS exploitation scenarios (e.g., prototyping products and delivery scenarios)
- ☆ "Finalize" user requirements
- ☆ User Readiness Activities
- ☆ Infrastructure Readiness Projects

FY 28+

- ☆ "Finalize" and test infrastructure
- ☆ User readiness and training
- ☆ Organizational Readiness

Initial Roadmap Analysis complete (see Outbrief Slides)

Next steps: Develop a comprehensive NWS Satellite Readiness Project Plan (The Plan) and Concept of Operations
(ConOps) for NWS exploitation of data from NESDIS' current and upcoming satellite missions.

TOWR-S Update

Thank You

Return to overview

Next TOWR-S Update

July 2025
(tentative, date TBD)

Return to overview

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- Links
  - NWSChat 2.0 **#towr-s Channel**
  - TOWR-S on VLab (https://vlab.no[In NWS Internal]-s)