CURRENT USES OF MCIDAS FOR GOES AT SSEC

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CIMSS/SSEC GOES Team

2025 MUG Meeting
May 21, 2025

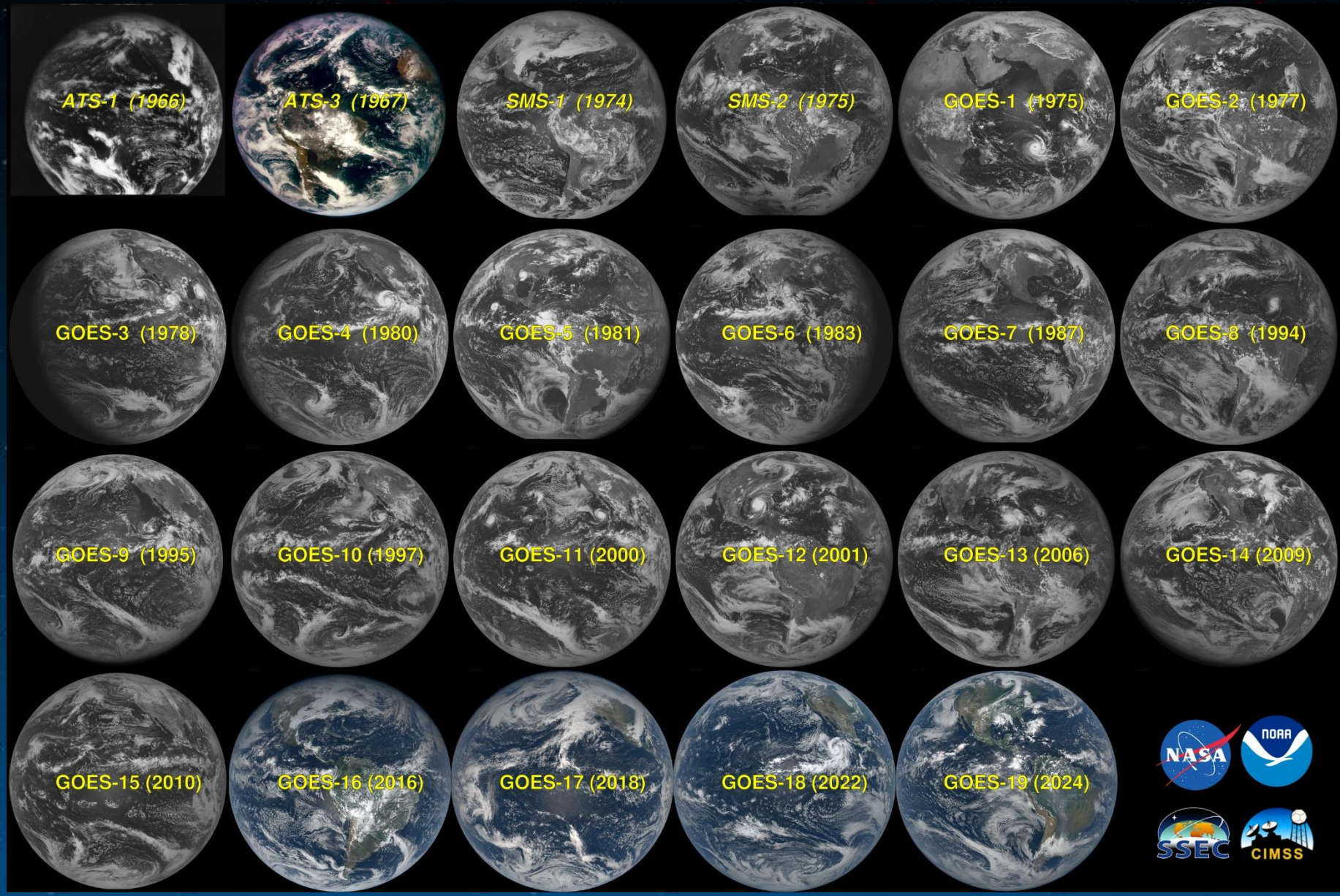
CIMSS / SSEC / UW-Madison

Special Mention

- Chris Schmidt
- Dave Stettner
- Rick Kohrs
- Scott Bachmeier
- Tim Olander

SSEC, CIMSS, & GOES History

- Explorer 7 launched:
  - 13 October 1959
  - Vern Suomi (UW)
- SSEC formed:
  - 20 August 1965
- ATS-1 launched:
  - 7 December 1966
- McIDAS 1st Gen:
  - 1973
- GOES-A launched:
  - 16 October 1975
- CIMSS formed:
  - 1980



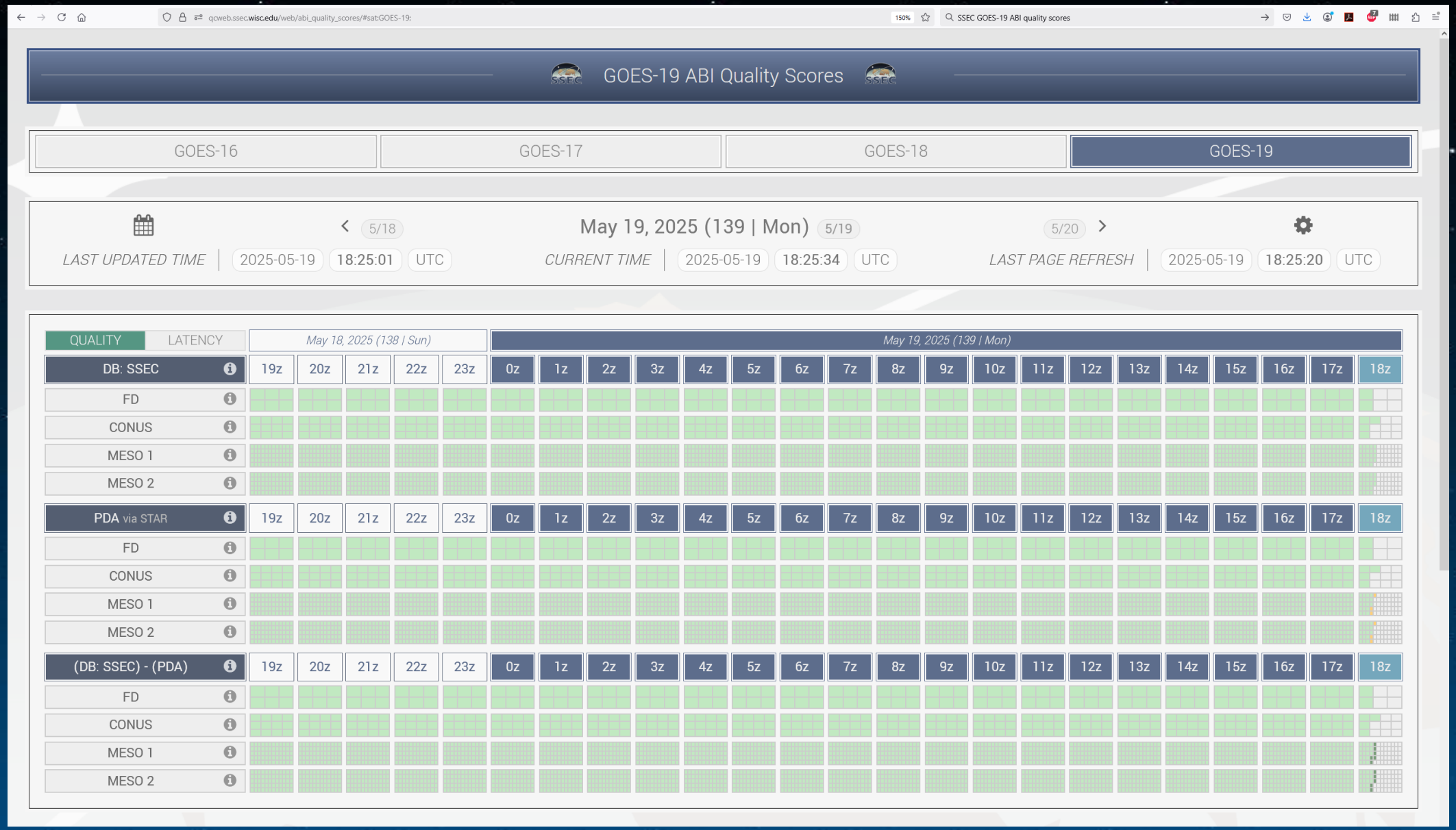
How we use McIDAS at CIMSS/SSEC for the GOES Program

- Pseudo-operational uses
  - Data quality monitoring
  - Tropical Cyclones
- Case Studies & Daily Workflow
  - Fire detection
- Training / Education / Webapps
- Outreach / CIMSS Satellite Blog

Data Quality Monitoring

https://cimss.ssec.wisc.edu/goes-r/abi-/16band_mainmenu.html

SSEC SDS ABI Ingest Monitor

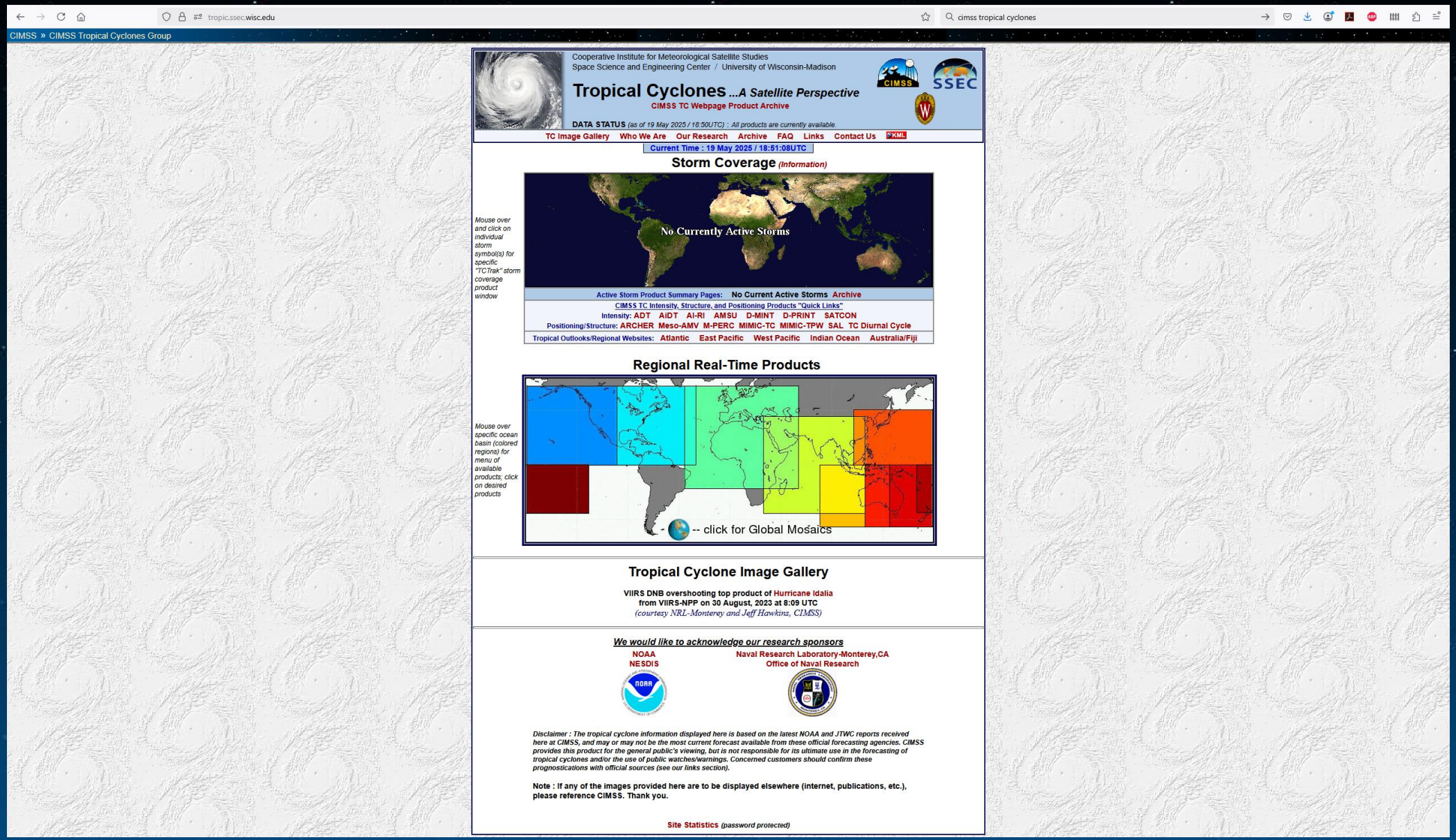


https://qcweb.ssec.wisc.edu/web/abi_quality_scores/#sat:GOES-19;

Pseudo-operational Hazard Monitoring & Daily Workflow

- Tropical Cyclones
- Fire Detection

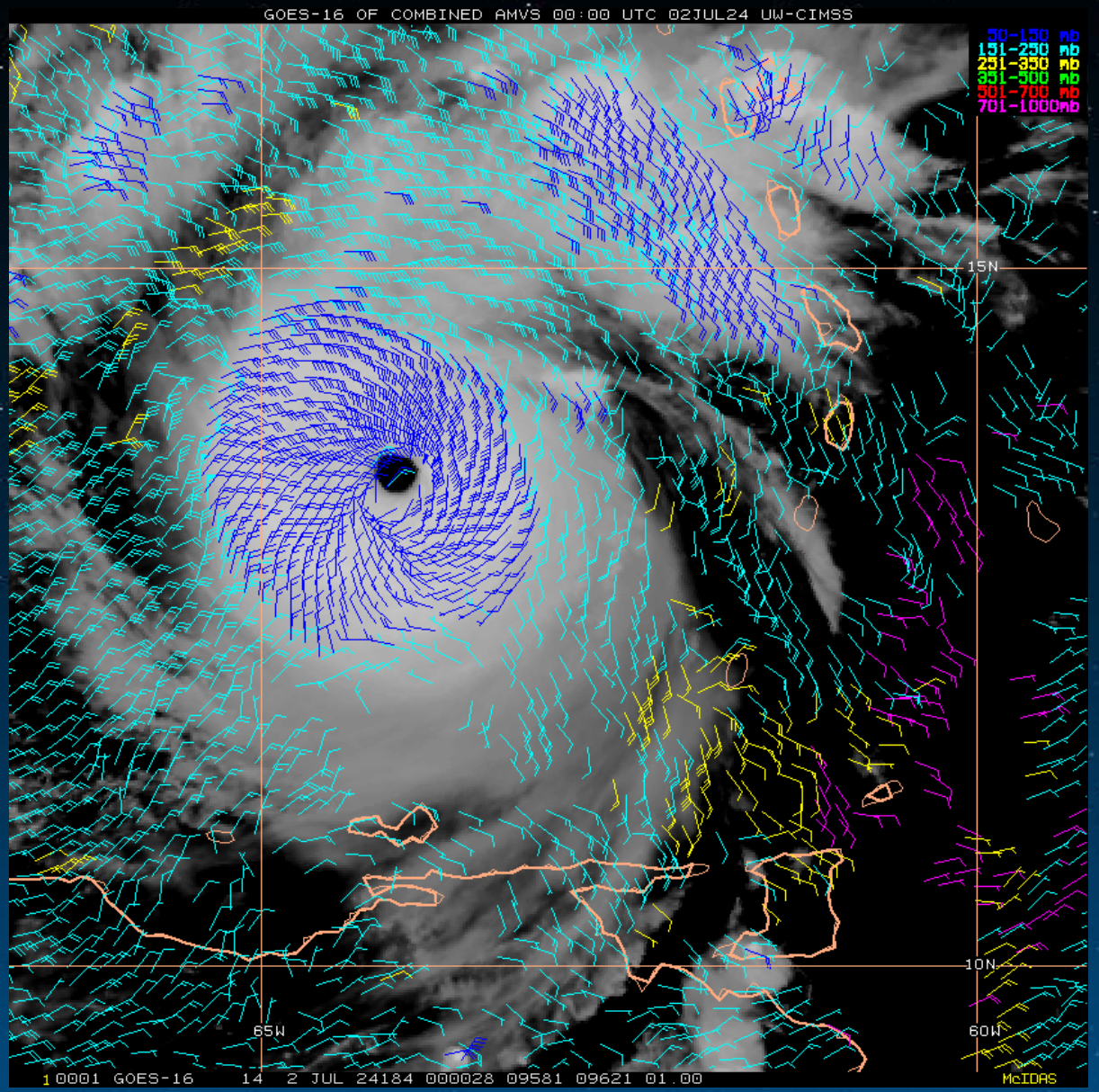
Tropical Cyclones



https://tropic.ssec.wisc.edu/

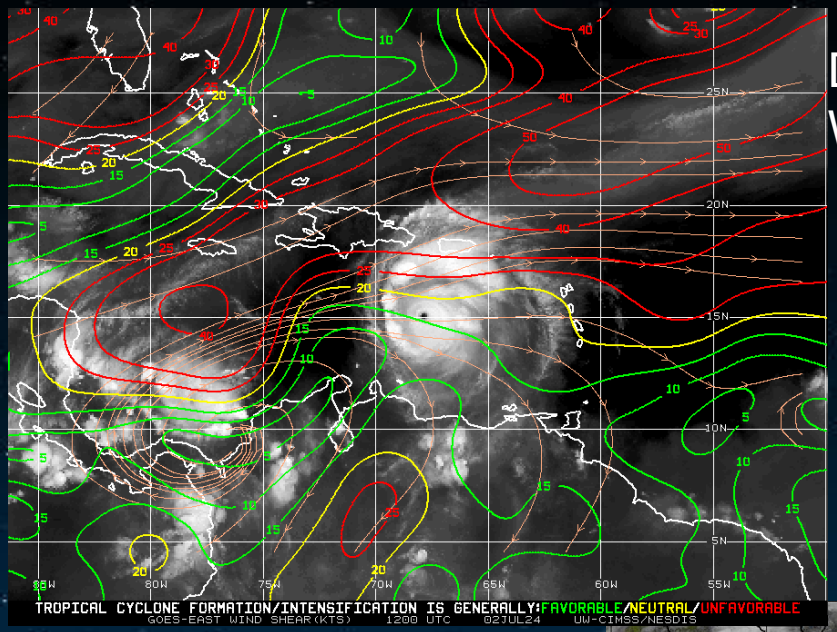
Hurricane Beryl July 2024

GOES-16 ABI mesoscale sector Atmospheric Wind Vectors (AMVs) produced every 15-minutes

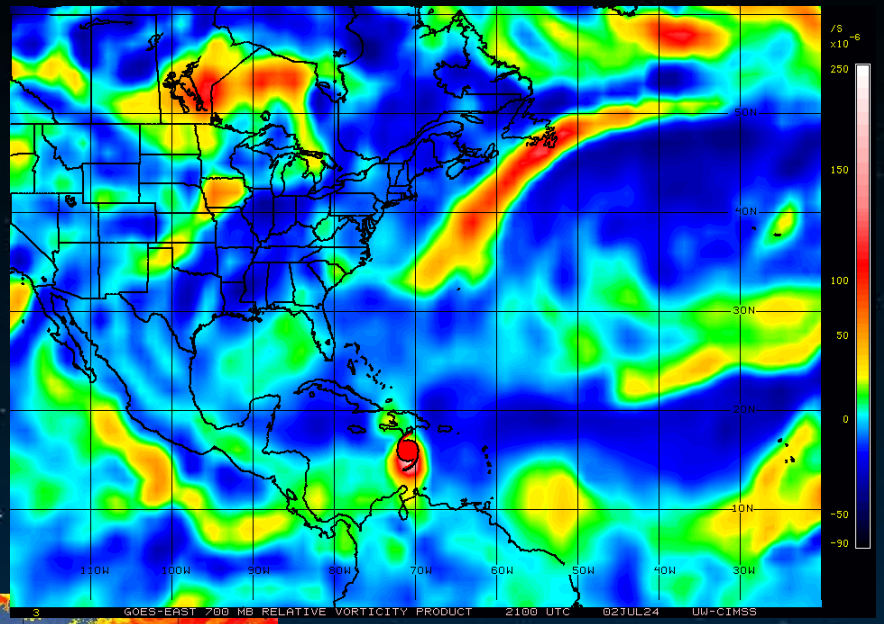


Hurricane Beryl July 2024

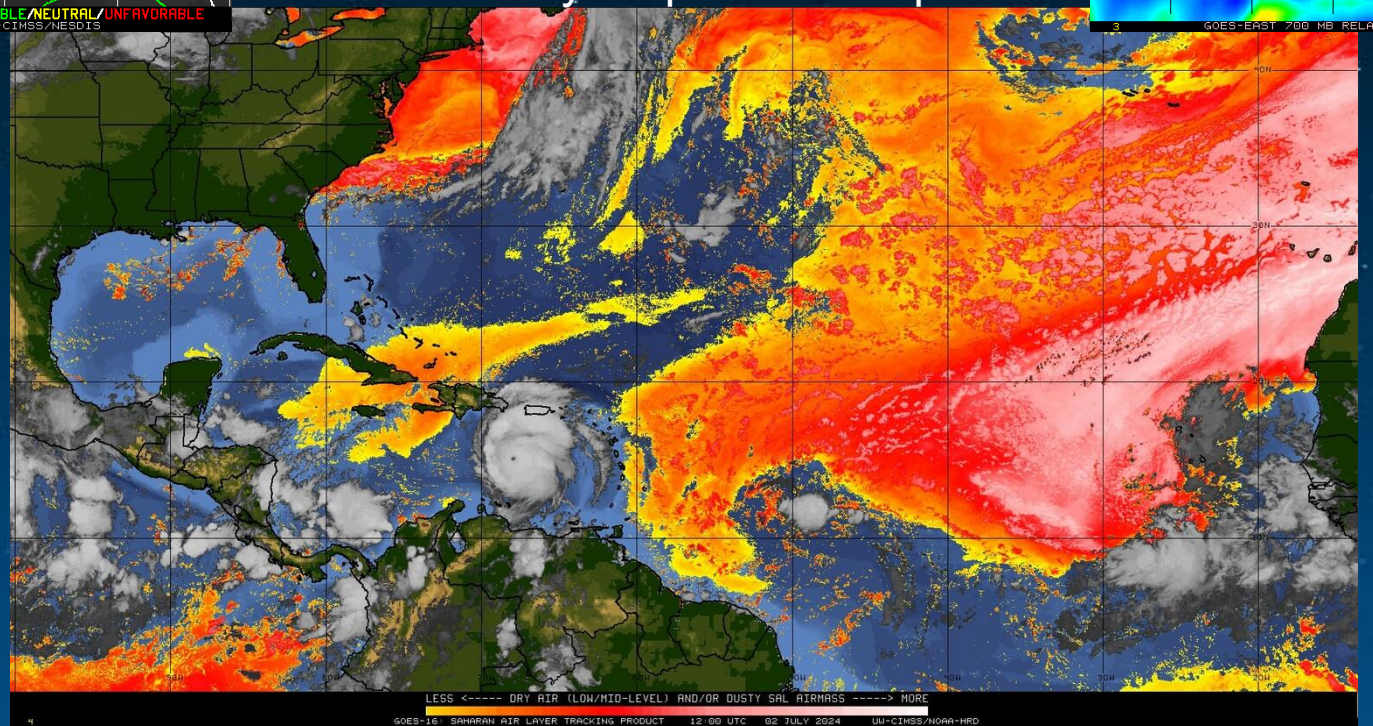
Deep Layer
Wind Shear



Relative
Vorticity

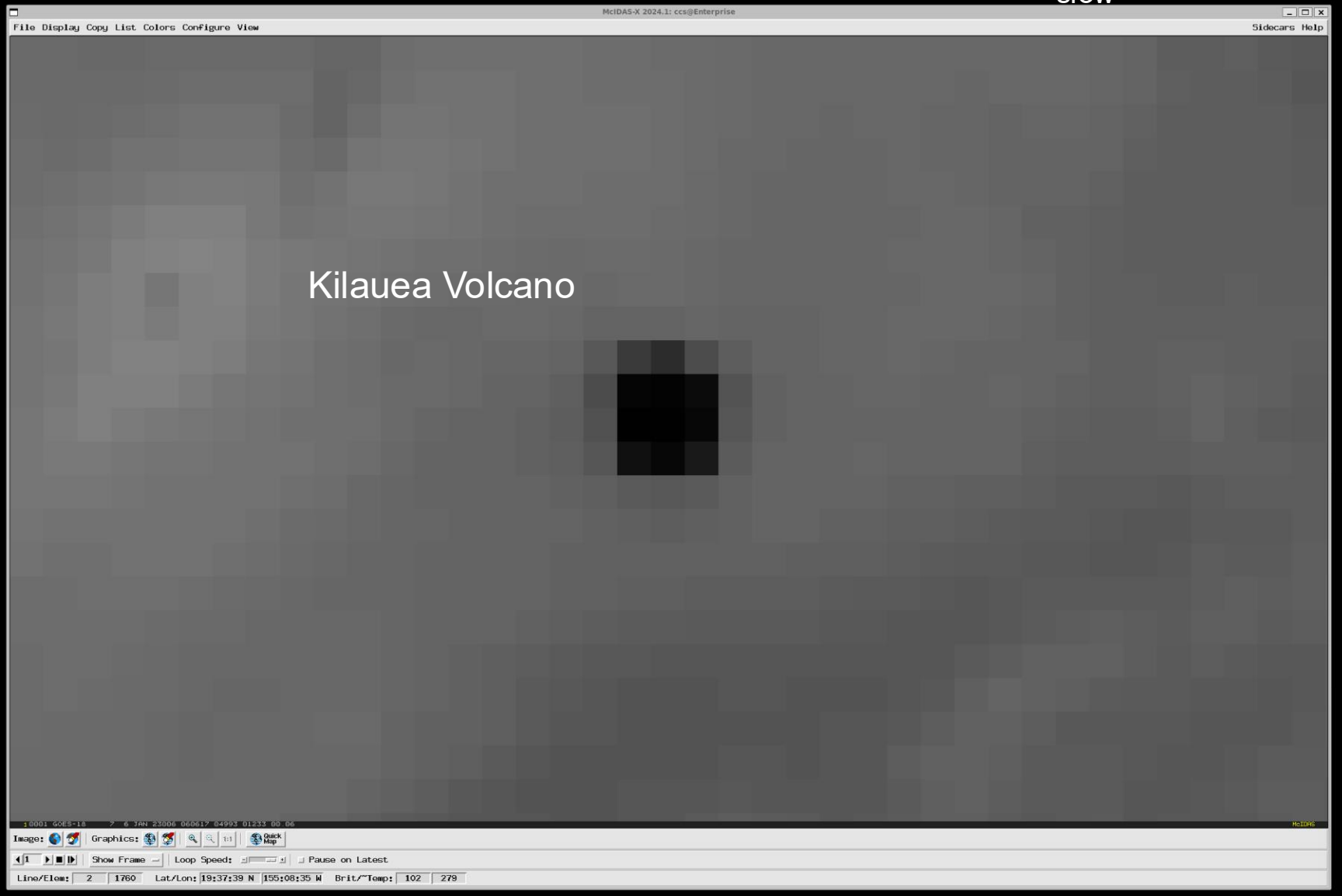


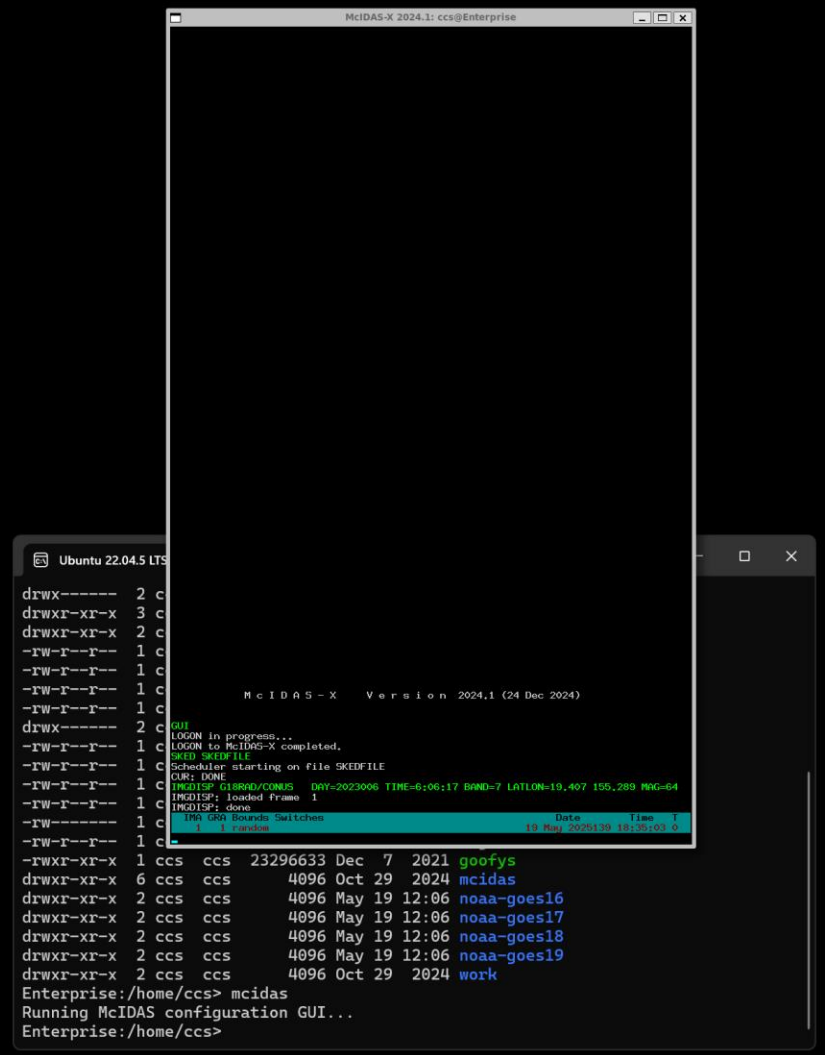
Saharan Air Layer split window product



McIDAS on Windows 11 with the AWS archive

- McIDAS is easy to use on Windows 10 and very easy on Windows 11 thanks to its X-Windows replacement
- AWS archive can be linked to local directories using a utility like “goofys”
- Once the local directory link is established, the datasets can be treated as an archive server
- At this point it can be treated like any archive dataset while pulling from AWS; performance is generally good though initial operations can be slow





Training / Education

- CIMSS Summer Workshop

- Weighting Function Page

- Web Apps
  - RGB

GOES Weighting Functions

cimss.ssec.wisc.edu/goes-wf/

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CIMSS GOES Realtime Weighting Functions

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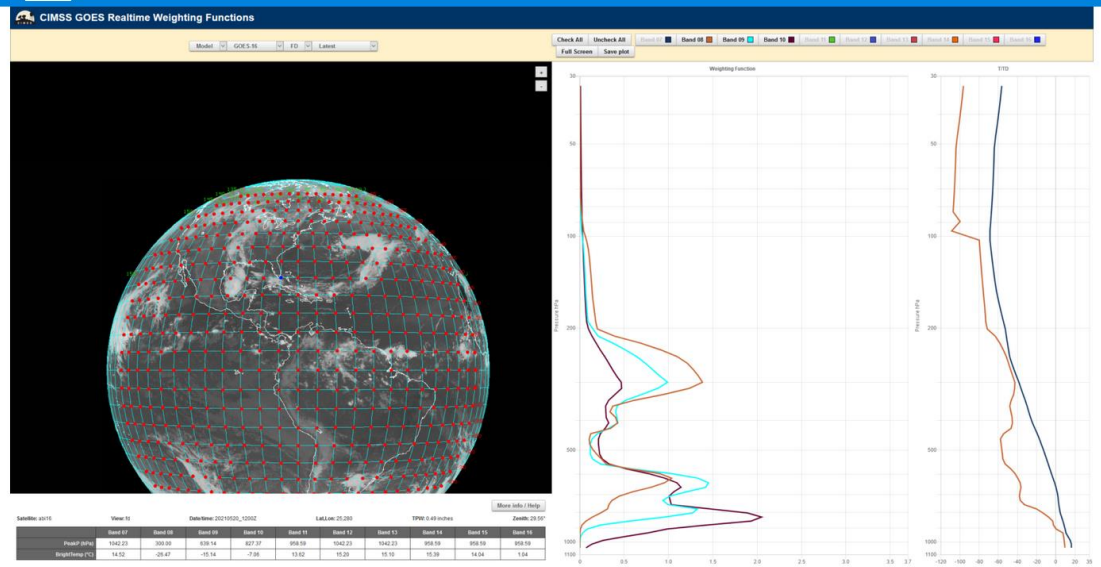

GOES weighting functions are available twice daily, valid for 00 and 12 UTC with either RAOB or GFS data (on a 5×5 degree grid) as input.

Click on the Plot Viewer to see the latest ABI weighting functions or choose from the previous 8 days.

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https://cimss.ssec.wisc.edu/goes-wf/

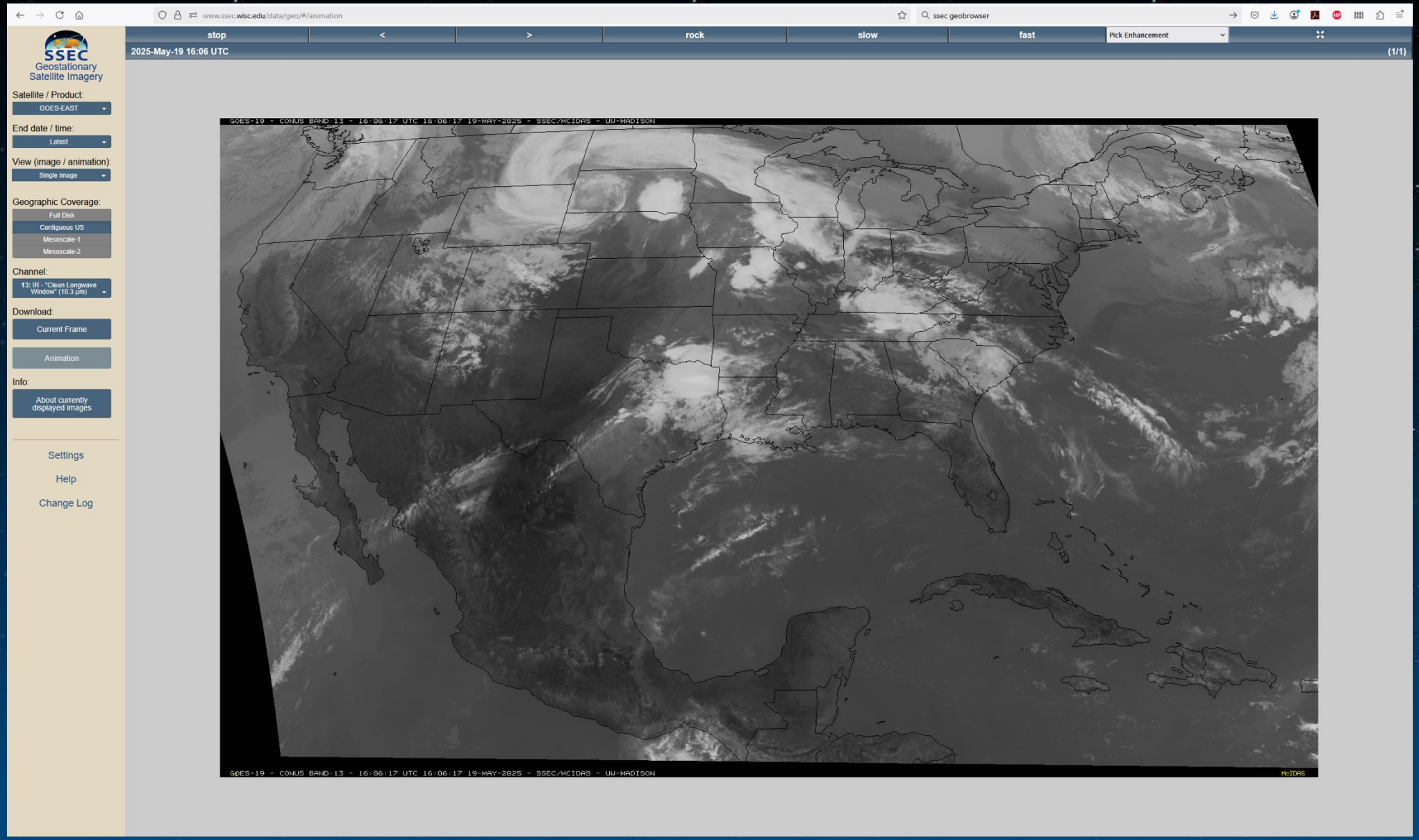
GOES-R WebApps

https://cimss.ssec.wisc.edu/education/goesr/webapps.html

Outreach

- Web imagery interfaces
- CIMSS Satellite Blog
  - 241 posts in 2024 mentioning GOES
- Social Media (Facebook, X)
- Building Tours
  - Science on a Sphere imagery (realtime and static)

SSEC GeoBrowser



https://www.ssec.wisc.edu/data/geo

SSEC SDS Composites

www.ssec.wisc.edu/data/composites

ssec sds composites

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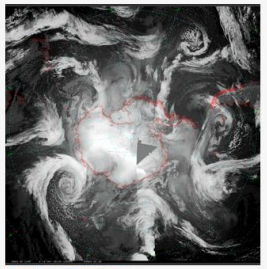
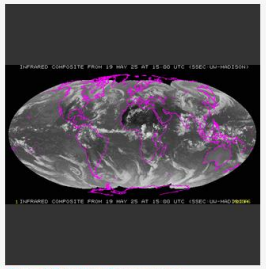
Satellite Composite Images

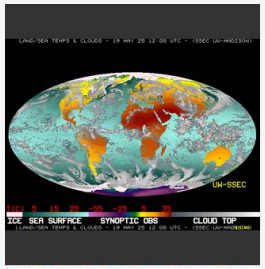
The following are some of the satellite composite imagery SSEC produces through the efforts of SSEC's Satellite Data Services and McIDAS.



Antarctic Composite



Global Satellite Composites



Global Satellite & Surface Temperature Montage

High Noon From Geostationary Orbit

Real-Time U.S. Composite Satellite Image

Rotating Globe Movie

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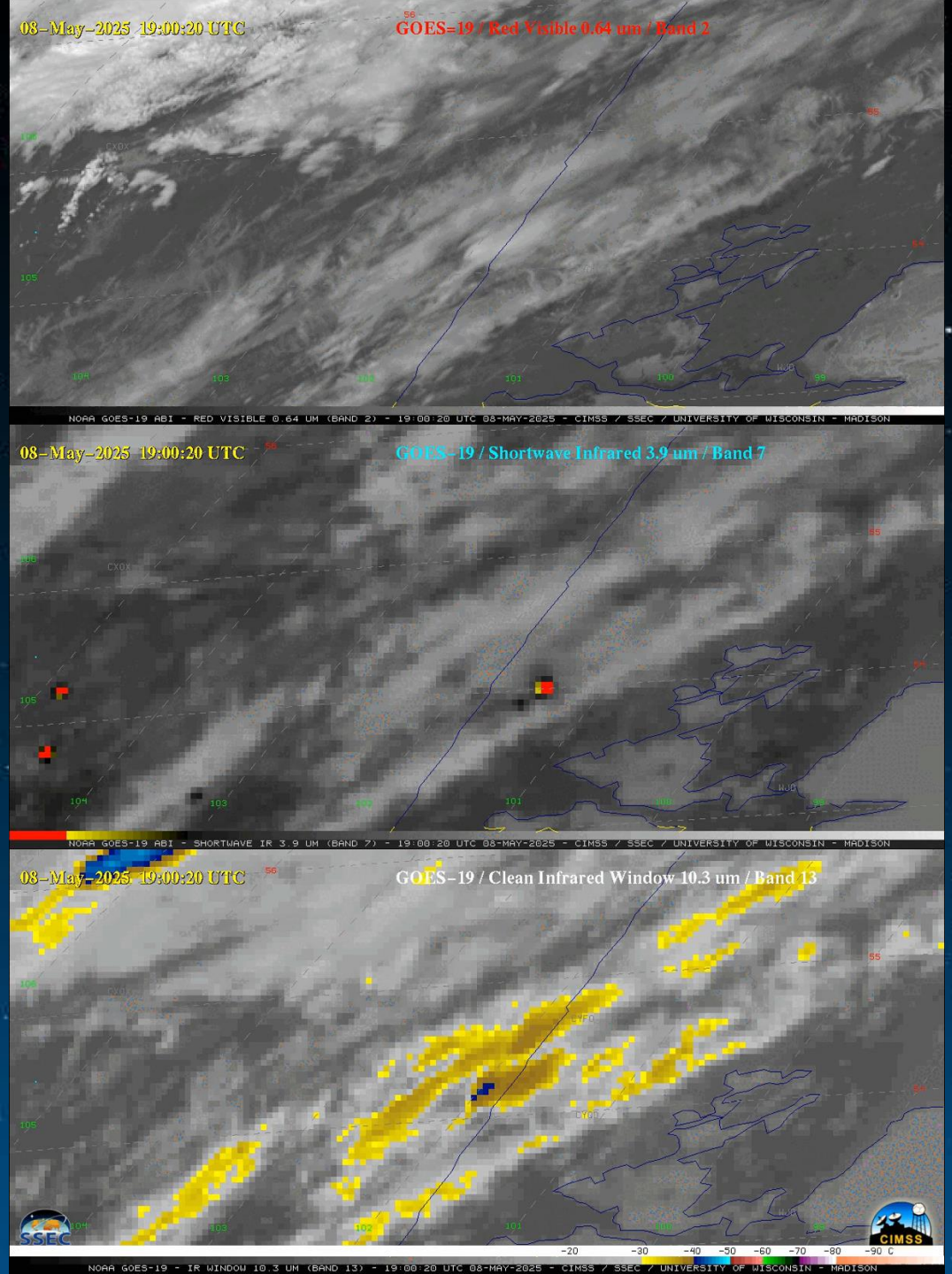
https://www.ssec.wisc.edu/data/composites

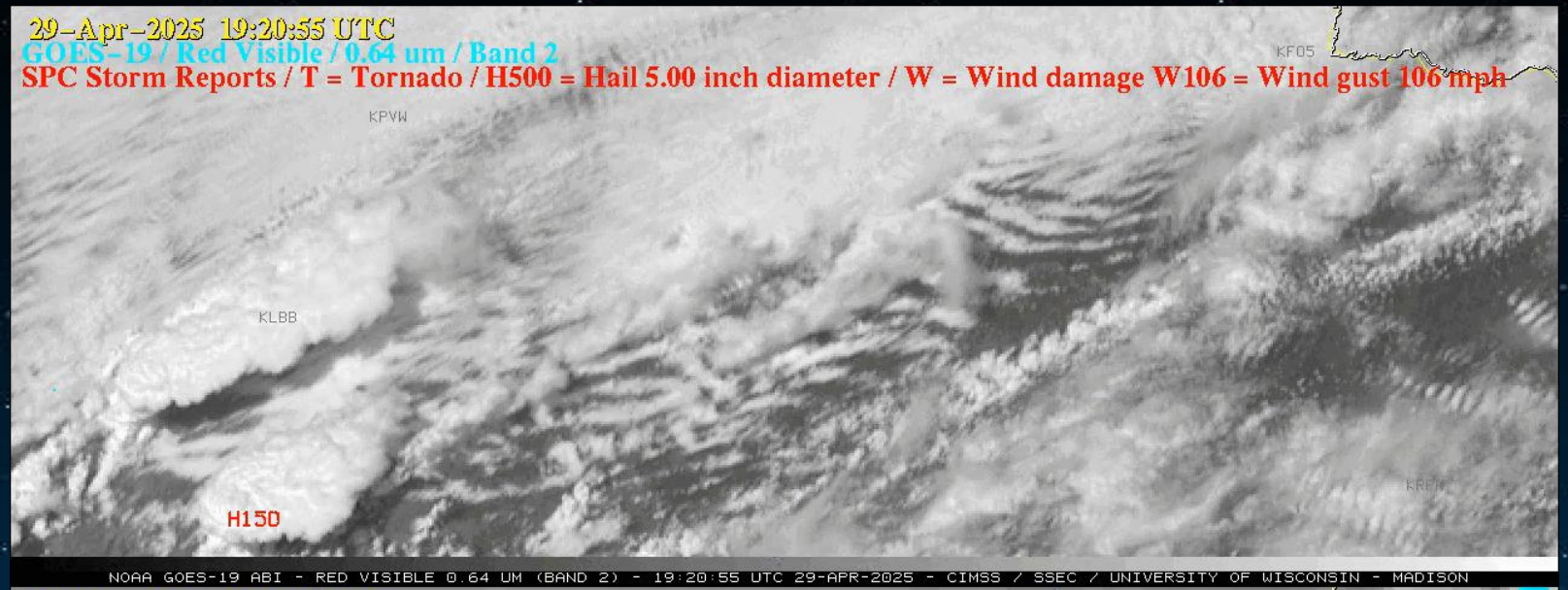
Wildfire in Saskatchewan produces a pyrocumulonimbus cloud

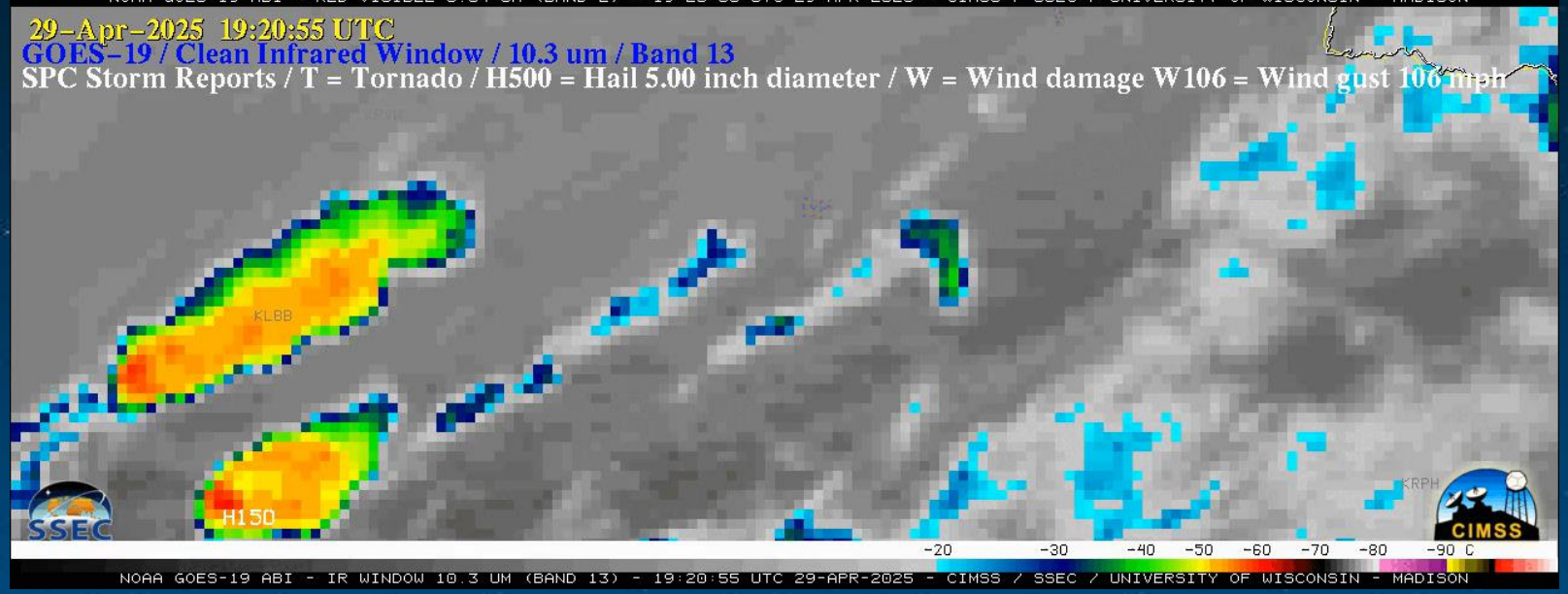
https://cimss.ssec.wisc.edu/satellite-blog/archives/64719

10-minute Full Disk scan GOES-19 (GOES-East) “Red” Visible (0.64 µm), Shortwave Infrared (3.9 µm) and “Clean” Infrared Window (10.3 µm) images (above) showed that a wildfire in central Saskatchewan produced a pyrocumulonimbus (pyroCb) cloud on 08 May 2025 (this was the first documented pyroCb of the 2025 North America wildfire season). The pyroCb exhibited cloud-top 10.3 µm infrared brightness temperatures (IRBTs) in the -40s C (denoted by shades of blue to cyan), a necessary condition to be classified as a pyroCb.



Giant hail and damaging winds in Texas



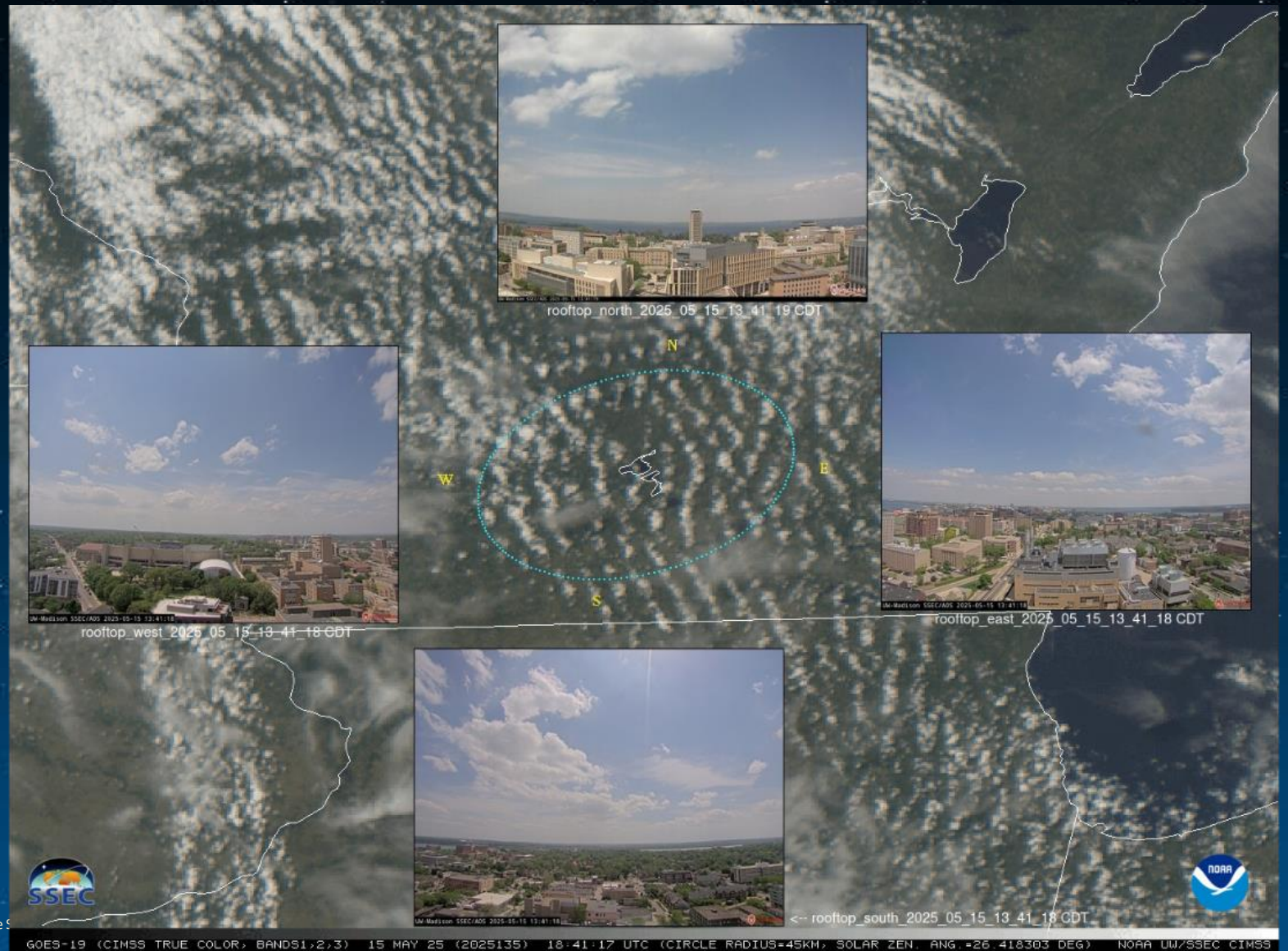


https://cimss.ssec.wisc.edu/satellite-blog/archives/64465

1-minute Mesoscale Domain Sector GOES-19 (GOES-East) “Red” Vis (0.64 µm) and “Clean” IR Window (10.3 µm) images (above) showed thunderstorms that produced giant hail (as large as 5.00 inches in diameter) and damaging wind gusts (as high as 106 mph) across the Texas Panhandle and N. Texas (SPC Storm Reports) on 29 April 2025. The IR images revealed pulses of thunderstorm overshooting tops that exhibited 10.3 µm brightness temperatures as cold as -78ºC (brighter white pixels embedded within dark black regions) — and the signature of an Above-Anvil Cirrus Plume was evident in Visible imagery (although the warmer AACP signature was less distinct in the lower-resolution Infrared images).

AOSS Rooftop Cameras + GOES

- https://cimss.ssec.wisc.edu/goes/rtc_goes_east

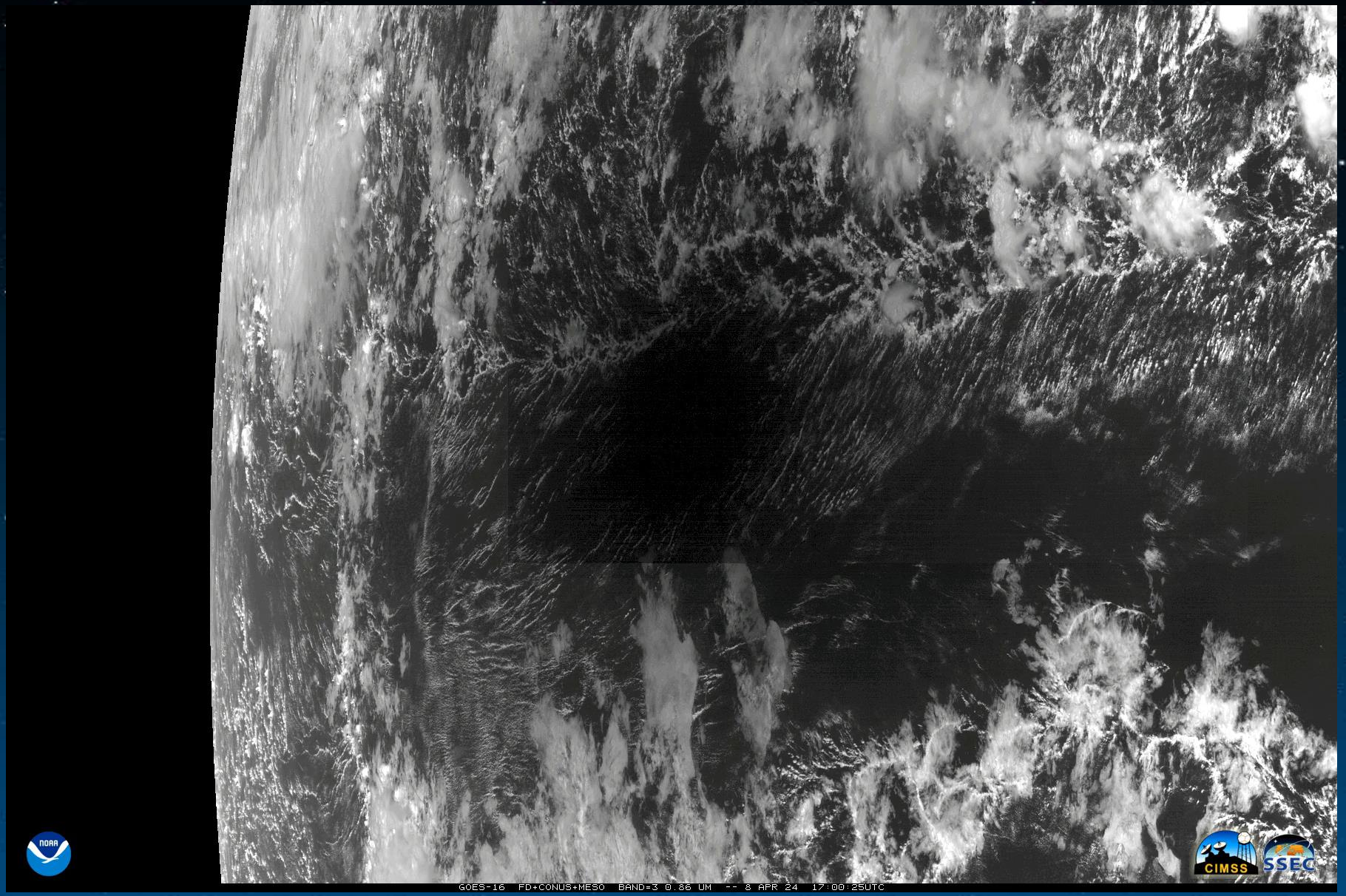


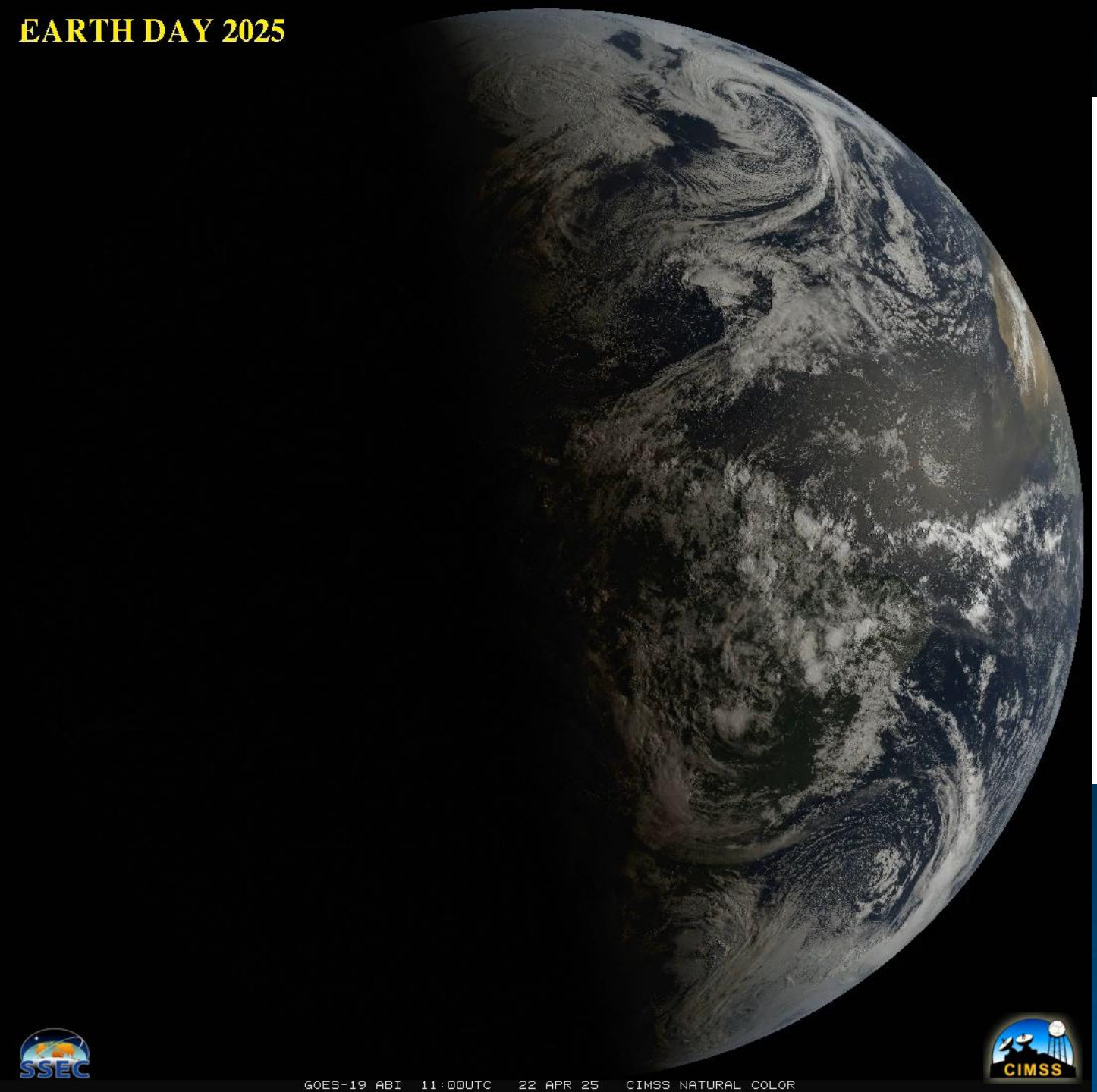
April 8, 2024 Total Solar Eclipse Animation

ABI mesoscales called to track predicted shadow path. (Research Request)

McIDAS-X used to generate MESO (1-minute), CONUS (5-minute), and Full Disk (10-minute) images.

GOES-16 (GOES-East)





On X (Twitter)

UW-Madison CIMSS
@UWCIMSS

Happy #EarthDay 2025! This @NOAASatellites GOES-19 image from noon today is your annual reminder that you live on a beautiful planet! These satellites provide more than stunning images and are essential for predicting dangerous weather.

4:34 PM · Apr 22, 2025 · **866** Views

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GOES-19
2025

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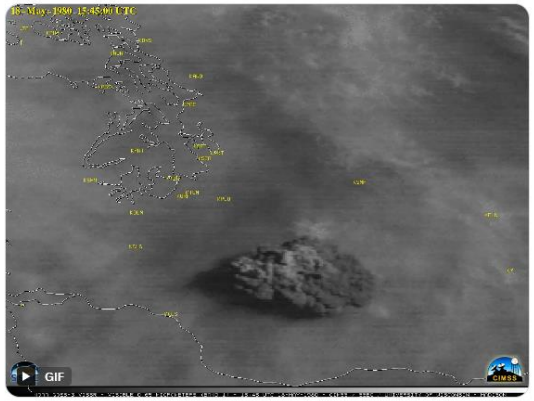
OTD 45 years ago, #MountStHelens erupted - additional imagery is available on the CIMSS Satellite Blog: cimss.ssec.wisc.edu/satellite-blog …



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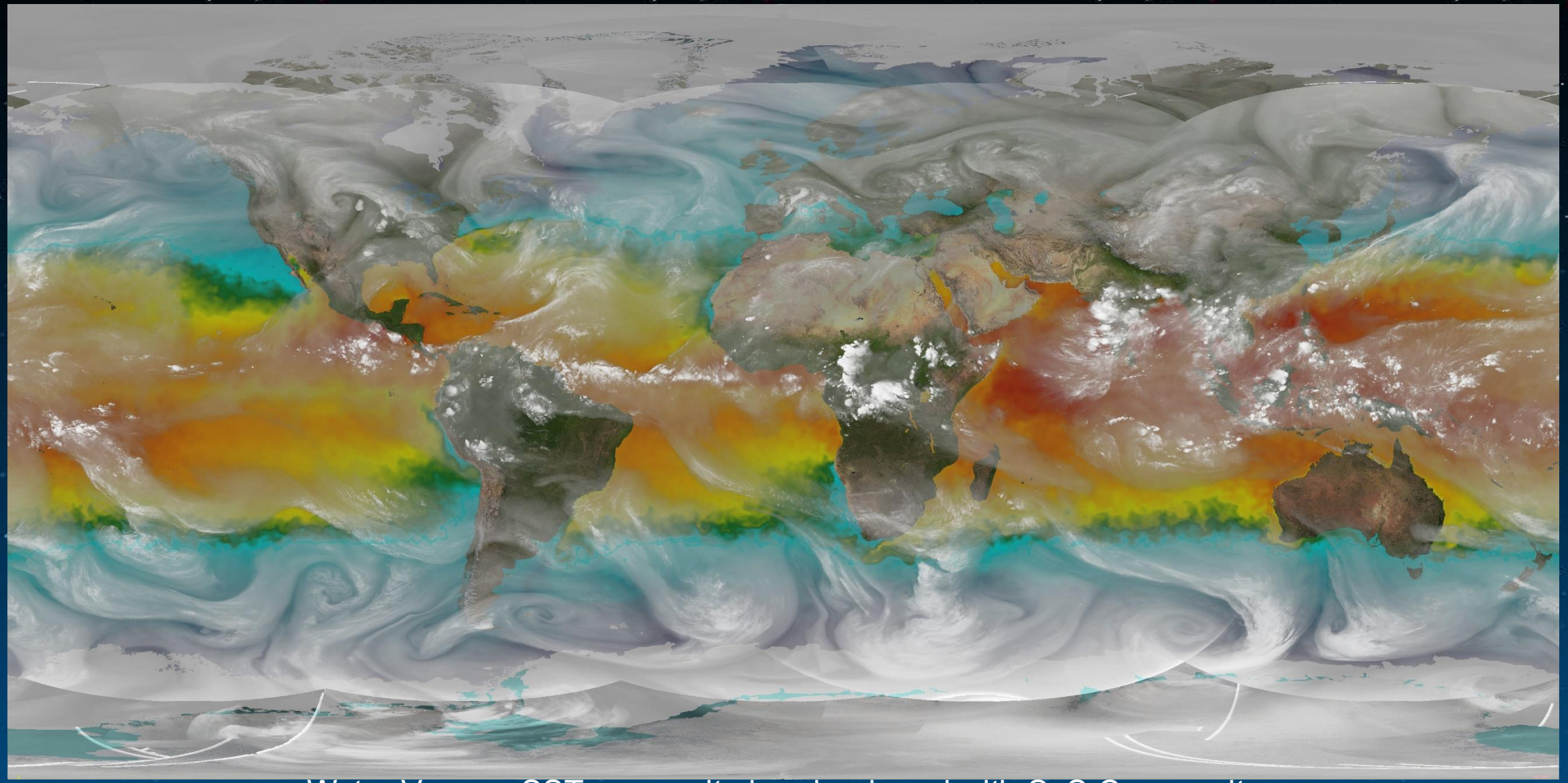
GOES-3
1980

Science on a Sphere (SoS)



Water Vapor + SST composite hourly, shared with SoS Community
https://bin.ssec.wisc.edu/pub/earthnow/noaa-sos-water-vapor-sst