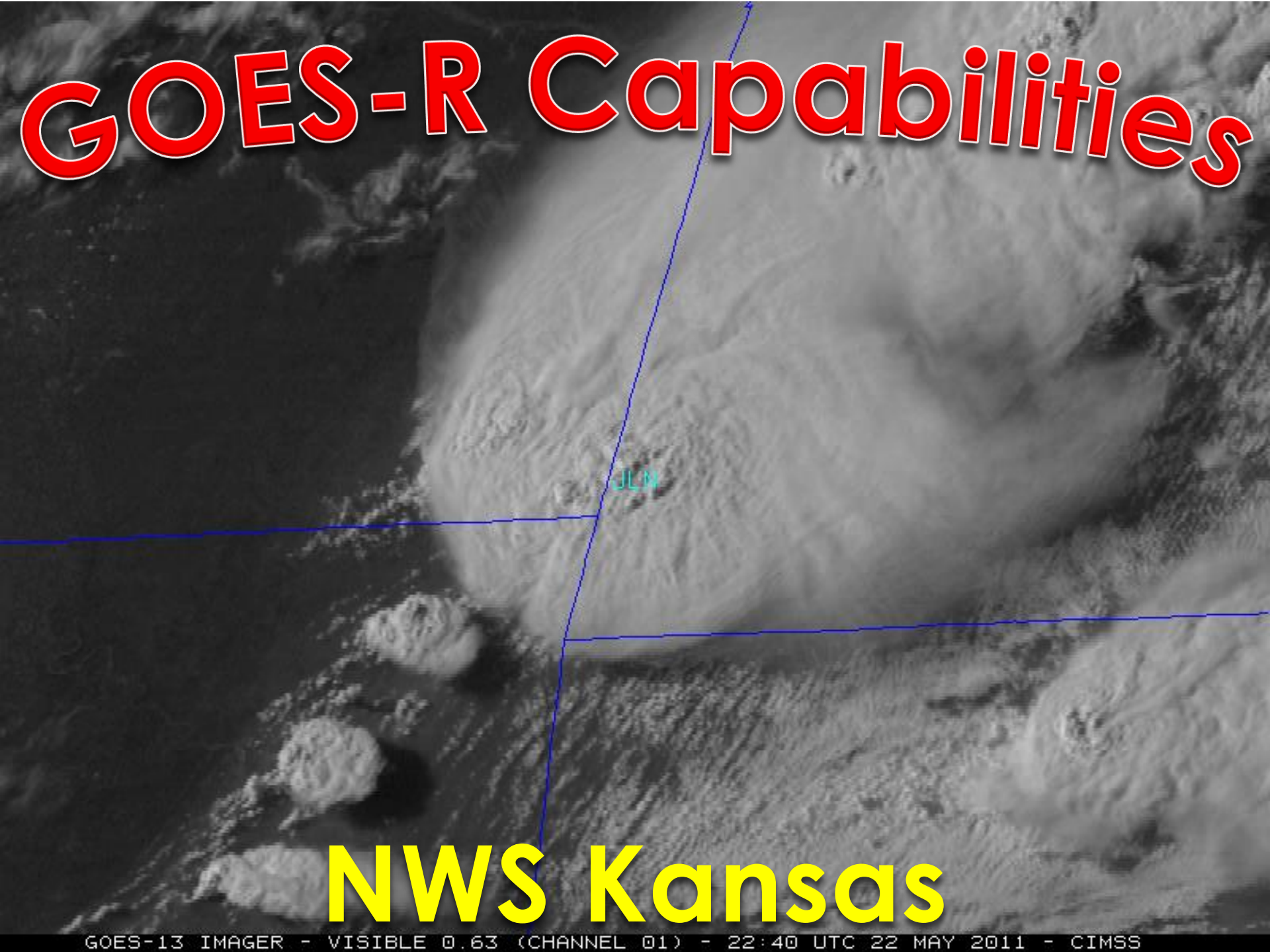
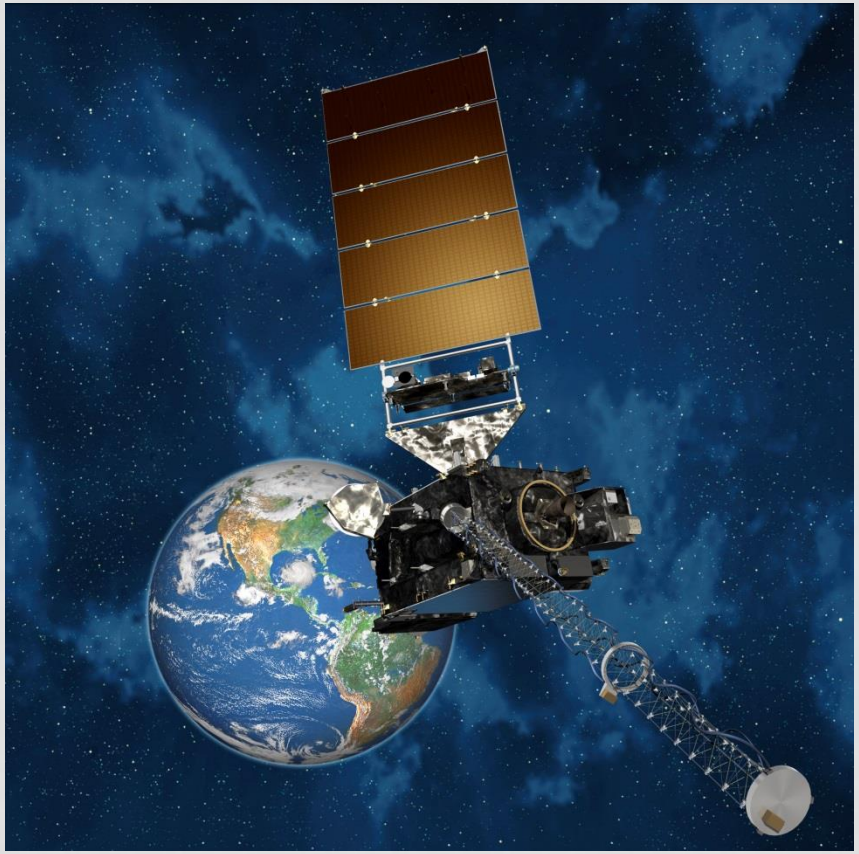
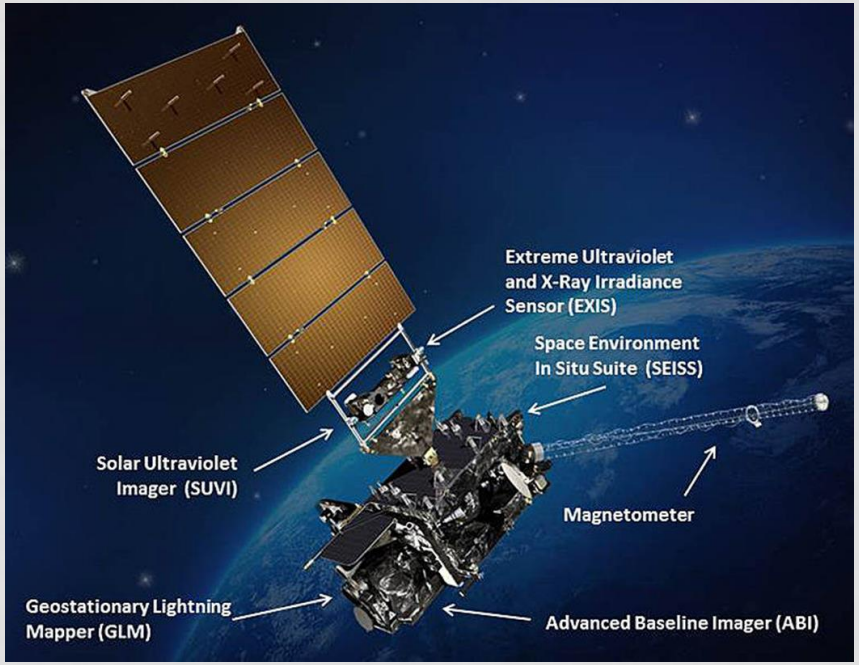

GOES-R Capabilities
JLN
NWS Kansas
GOES-13 IMAGER - VISIBLE 0.63 (CHANNEL 01) - 22:40 UTC 22 MAY 2011 - CIMSS

TOPICS



- Intro to Satellites
- GOES-R Specifics
- Applications of GOES Imagery
- GOES – Use with Caution

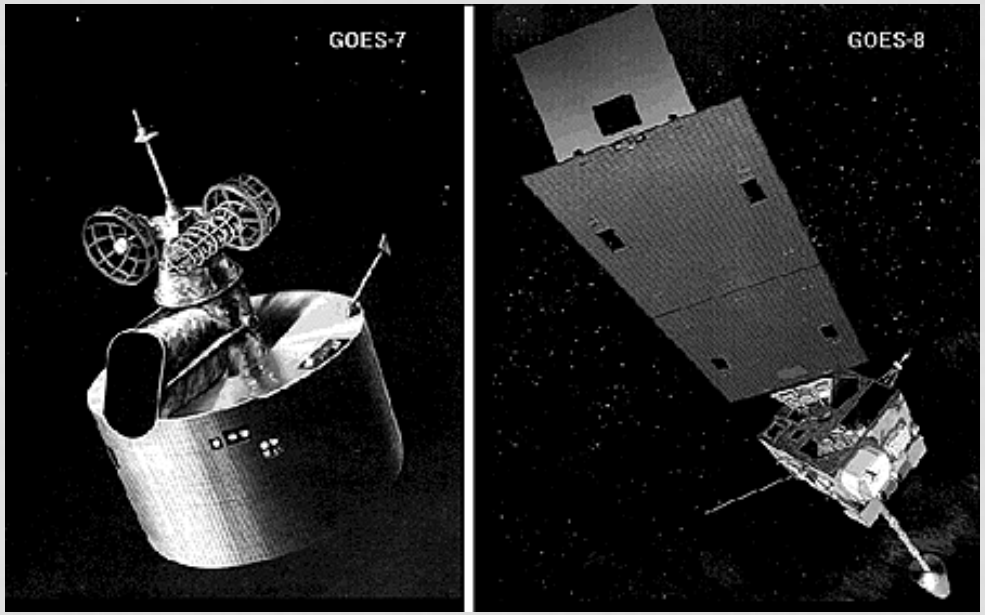
WHAT ARE WEATHER SATELLITES?



- Man-made instruments that observe and measure Earth's weather and climate
- 3 main sections:
  - Bus (body)
  - Instruments (sensors, imagers, sounders)
  - Power source (batteries and solar panels)
- Uses:
  - Help with daily forecasts
  - Predict and monitor dangerous weather
  - Contribute to long-term data sets for scientific research

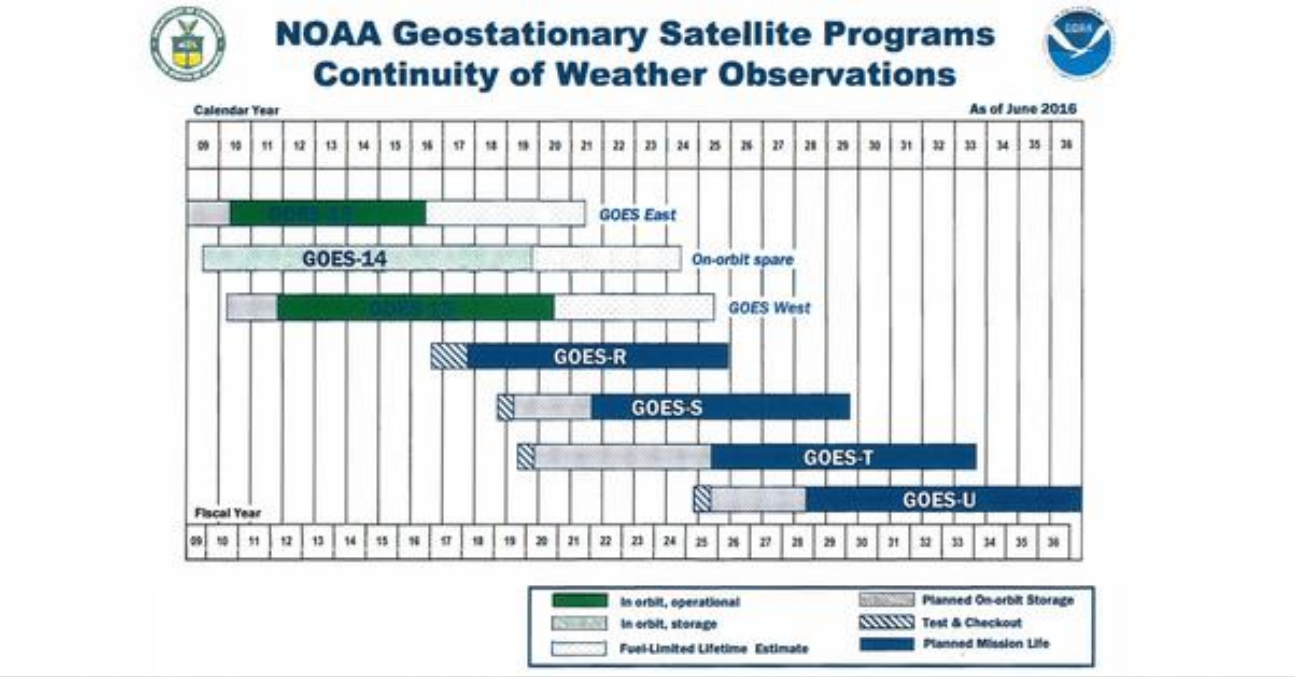
GOES

- Geostationary Operational Environmental Satellites
- Geostationary/Geosynchronous orbit: matches Earth's rotation, results in a fixed position
- Joint effort of NASA and NOAA
  - NASA builds and launches the satellites
  - NOAA operates them
  - Imagery since 1975

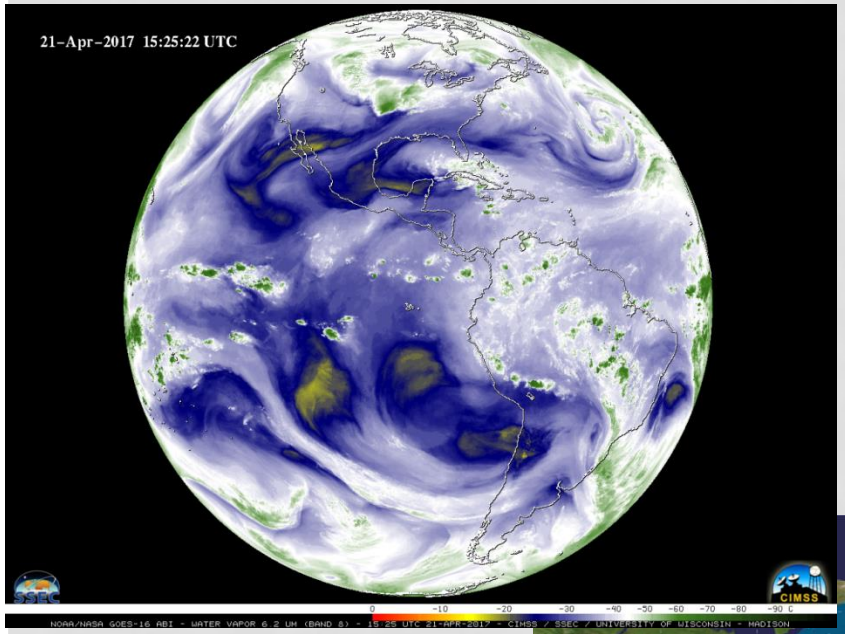


NEWEST SATELLITE SERIES: GOES-R

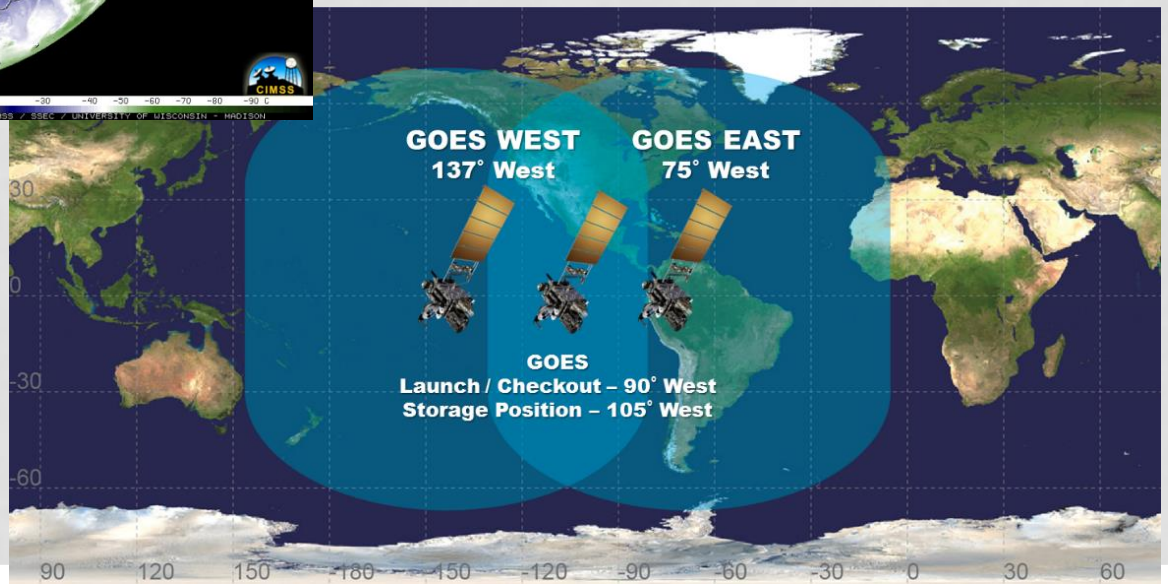
- A four-satellite program (GOES-R/S/T/U)
- Extends availability of operational GOES satellite system through 2036



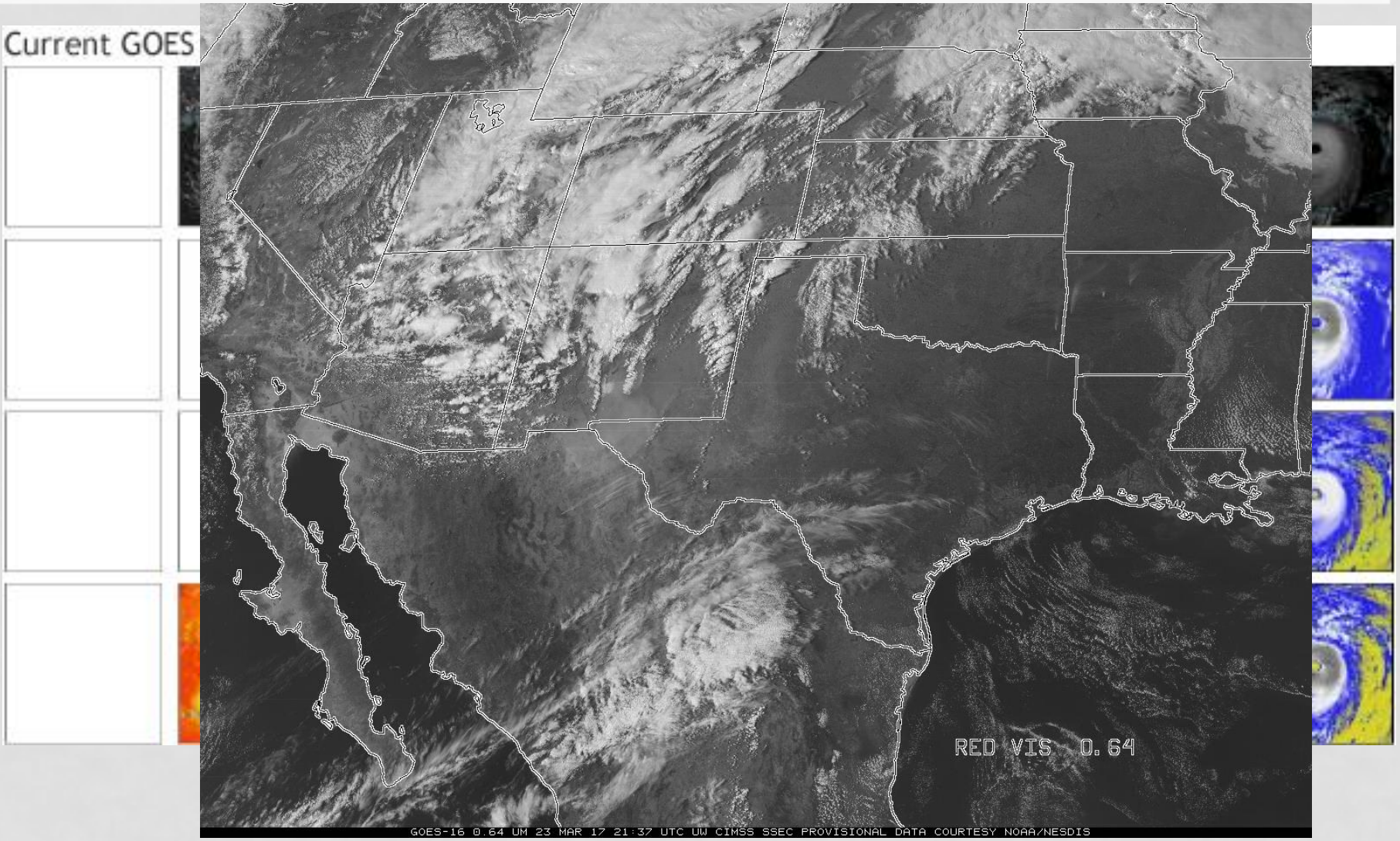
CURRENT GOES SATELLITES



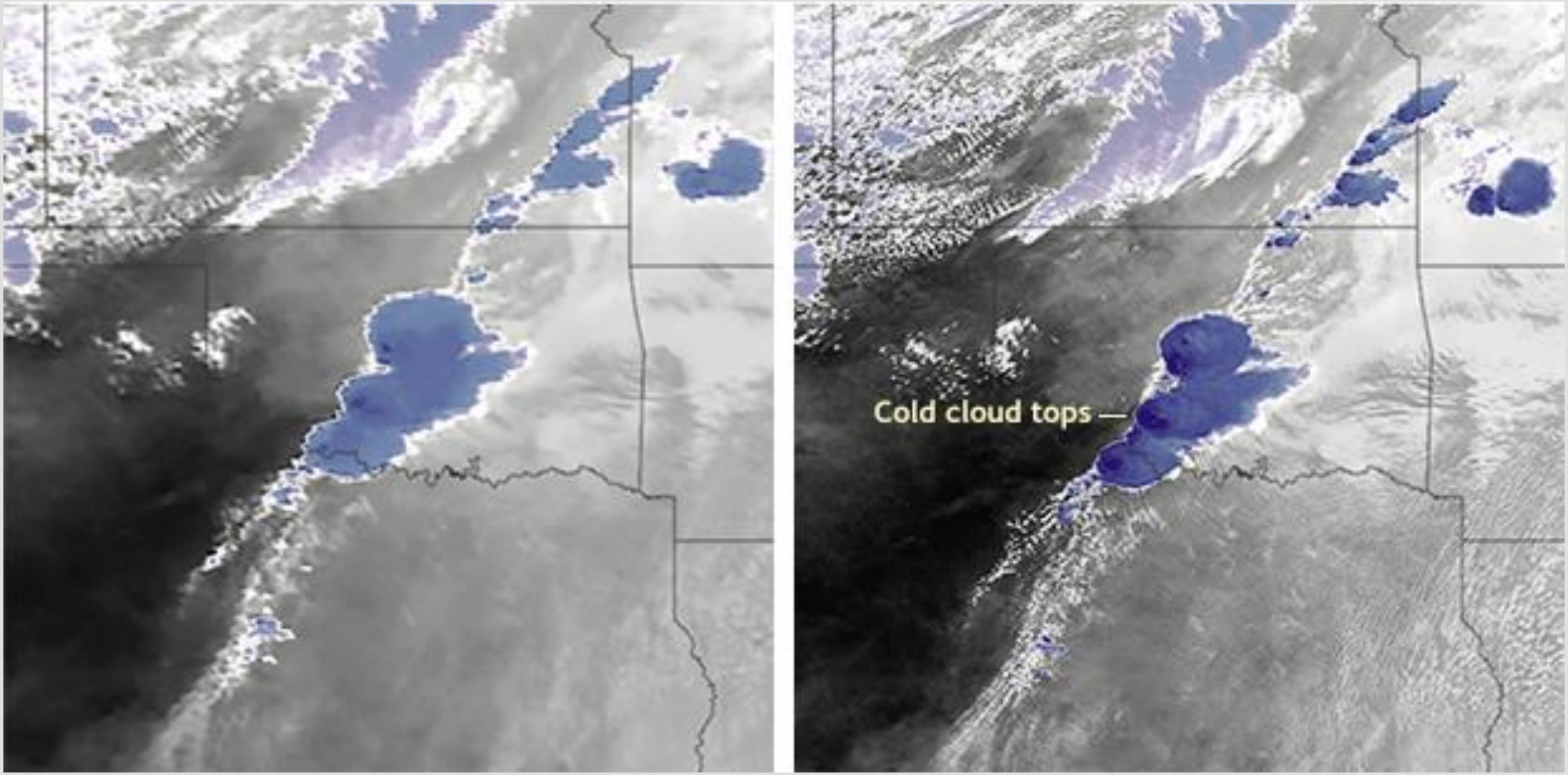
- GOES-16 is now GOES East
- GOES-17 launched 3/1/18
- GOES-17 data now flowing! (Preliminary/Non-Operational)



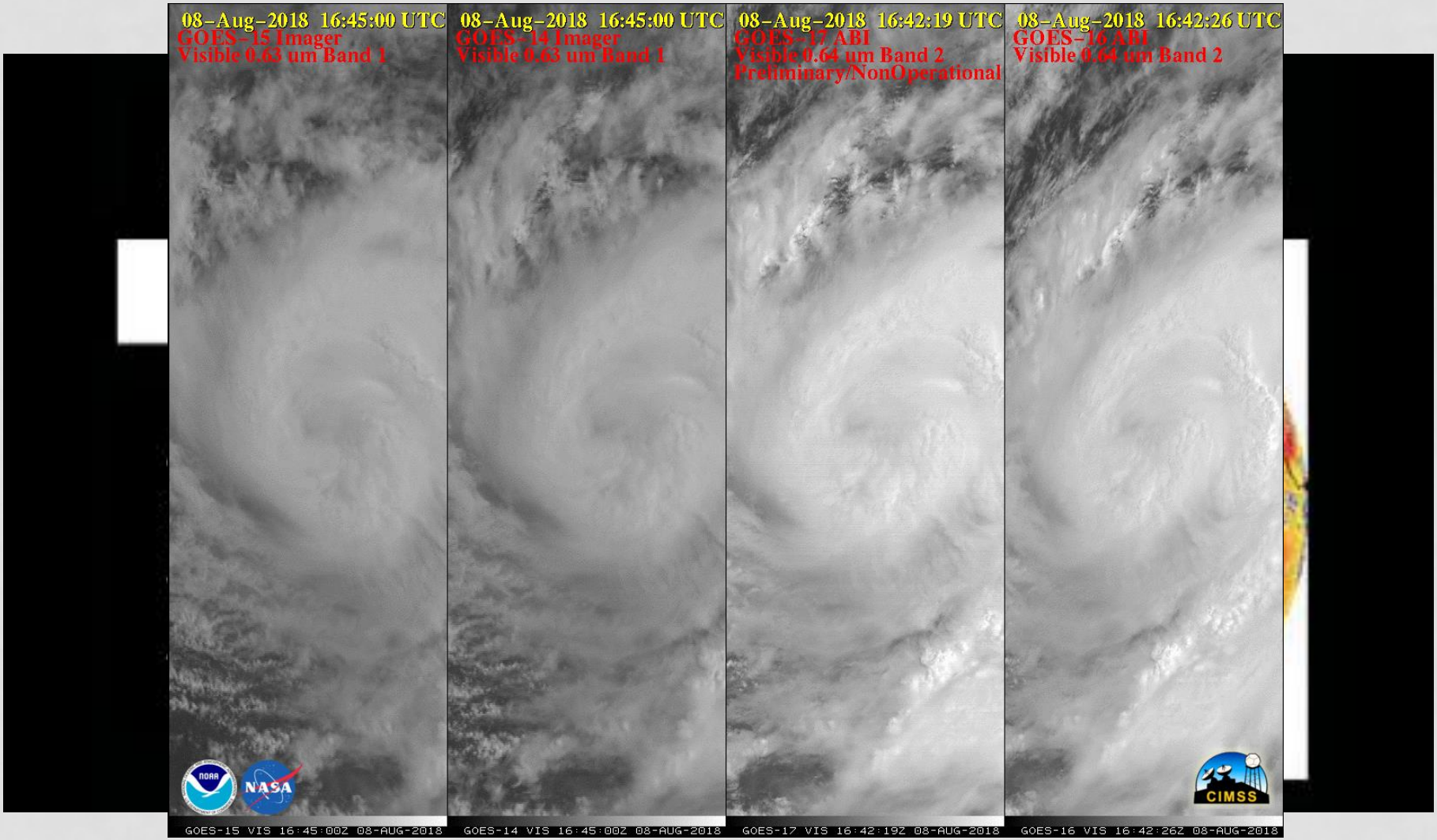
BENEFIT: 3X MORE CHANNELS



BENEFIT: 4X GREATER RESOLUTION



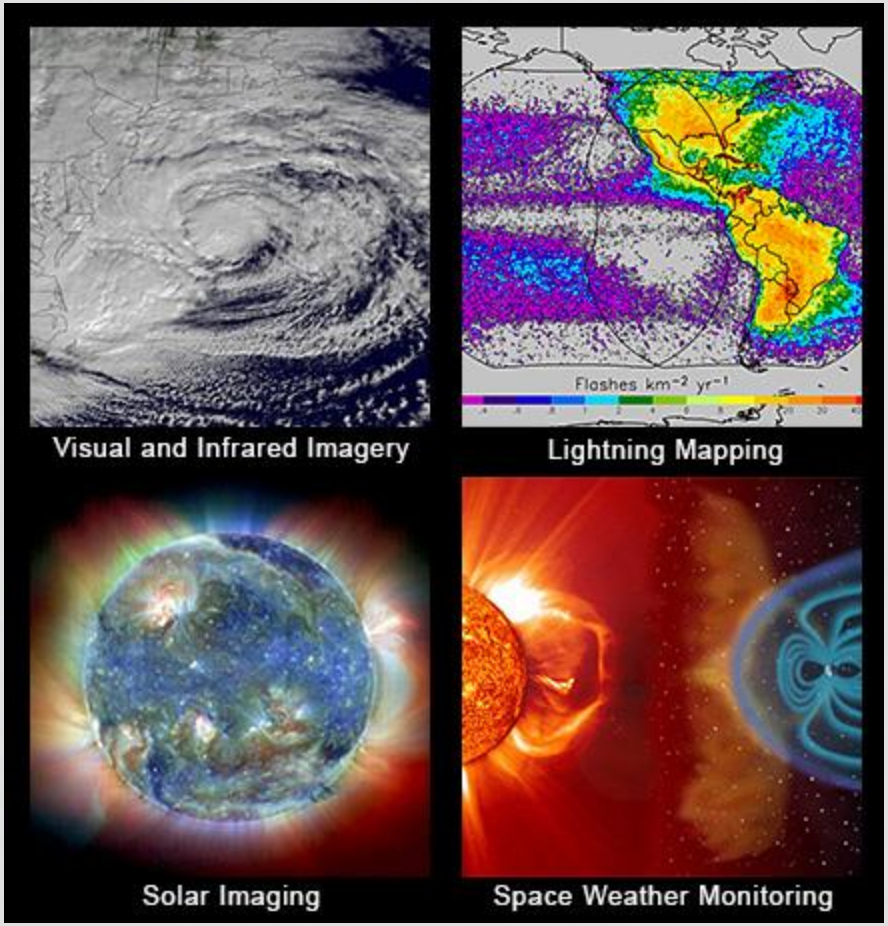
BENEFIT: 5X FASTER



WHAT IS GOES USED FOR?

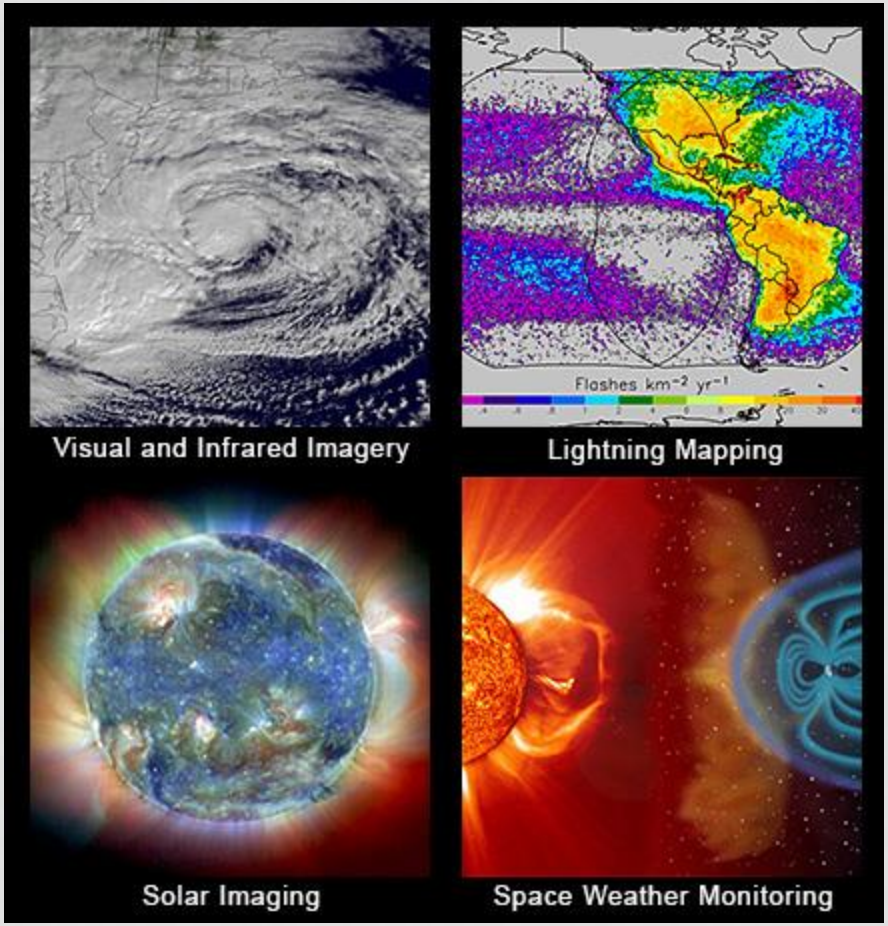
- 1-2 day forecasts
- Severe storm watches/warnings
- Monitoring like Radar
- Maritime forecasts
- Seasonal predictions
- Drought outlooks
- Space weather predictions

WHY GOES-R?



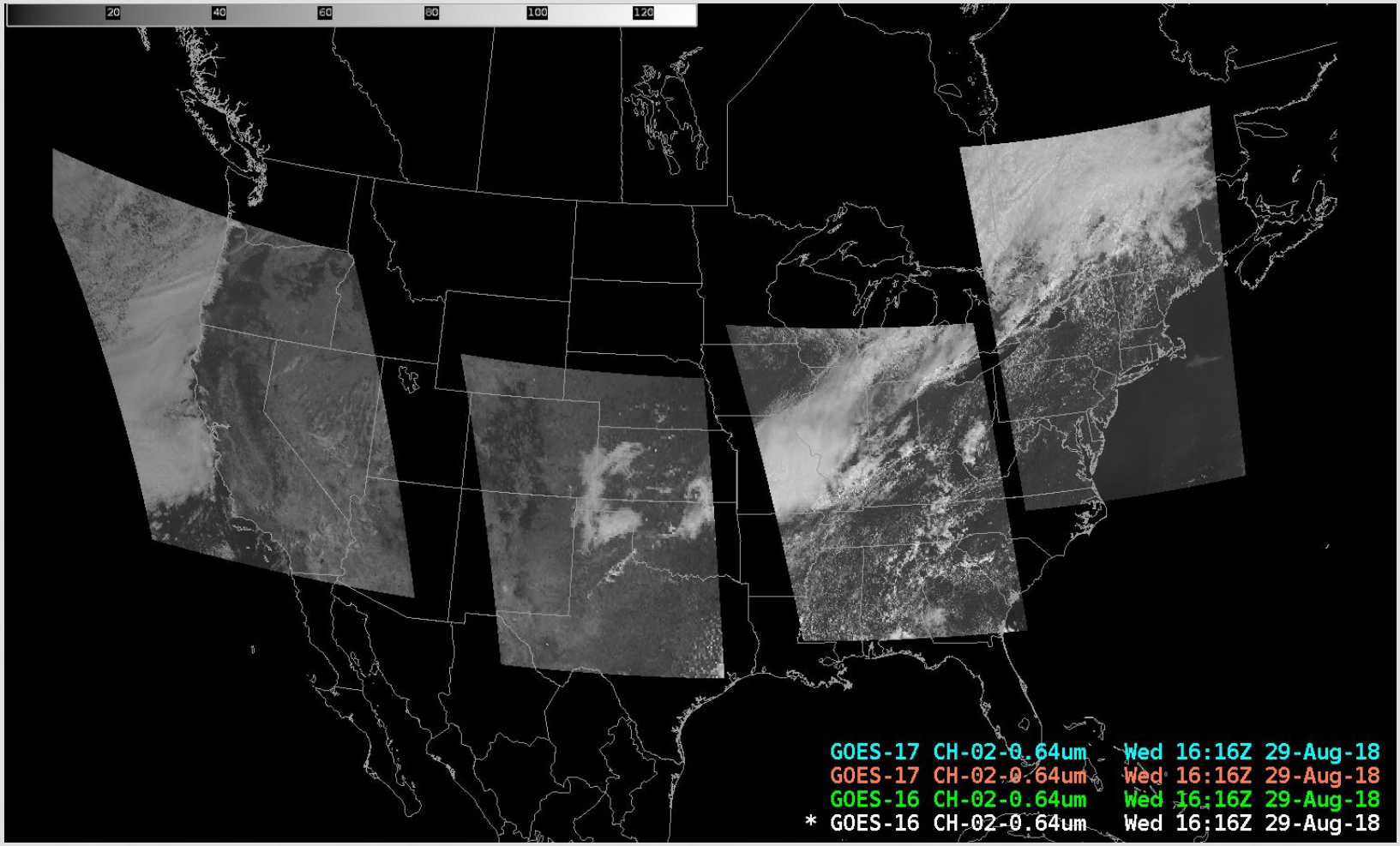
- Improved hurricane track and intensity forecasts
- Increased thunderstorm and tornado warning lead time
- Earlier warning of ground lightning strike hazards
- Better detection of heavy rainfall and flash flooding risks
- Improved aviation flight route planning
- Improved air quality warnings and alerts

WHY GOES-R? CONTINUED



- Better fire detection and intensity estimation
- Improved solar flare warnings for communications and navigation disruptions
- More accurate monitoring of energetic particles responsible for radiation hazards to humans and spacecraft
- Better monitoring of space weather to improve geomagnetic storm forecasting

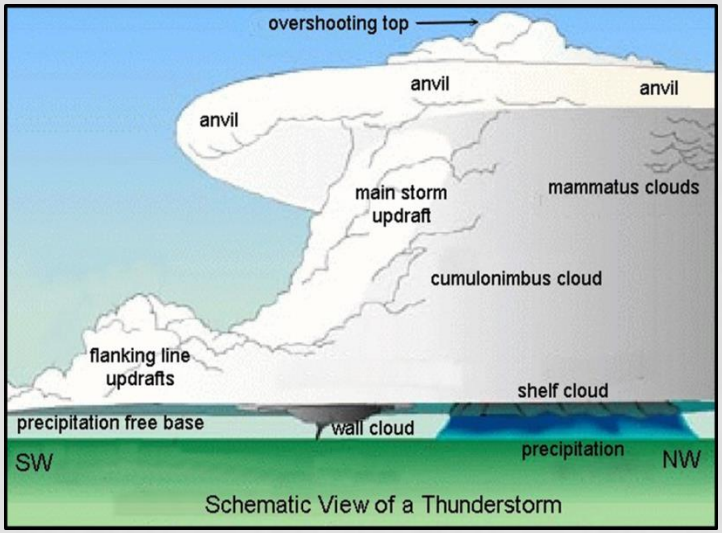
MESOSECTORS – FASTER THAN RADAR

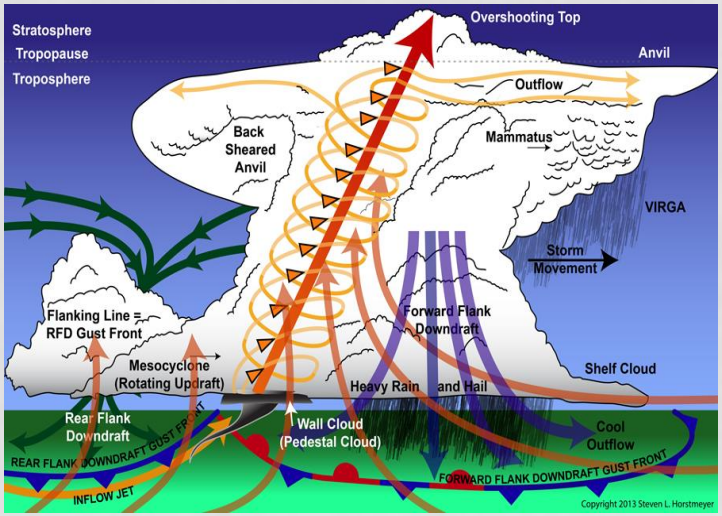


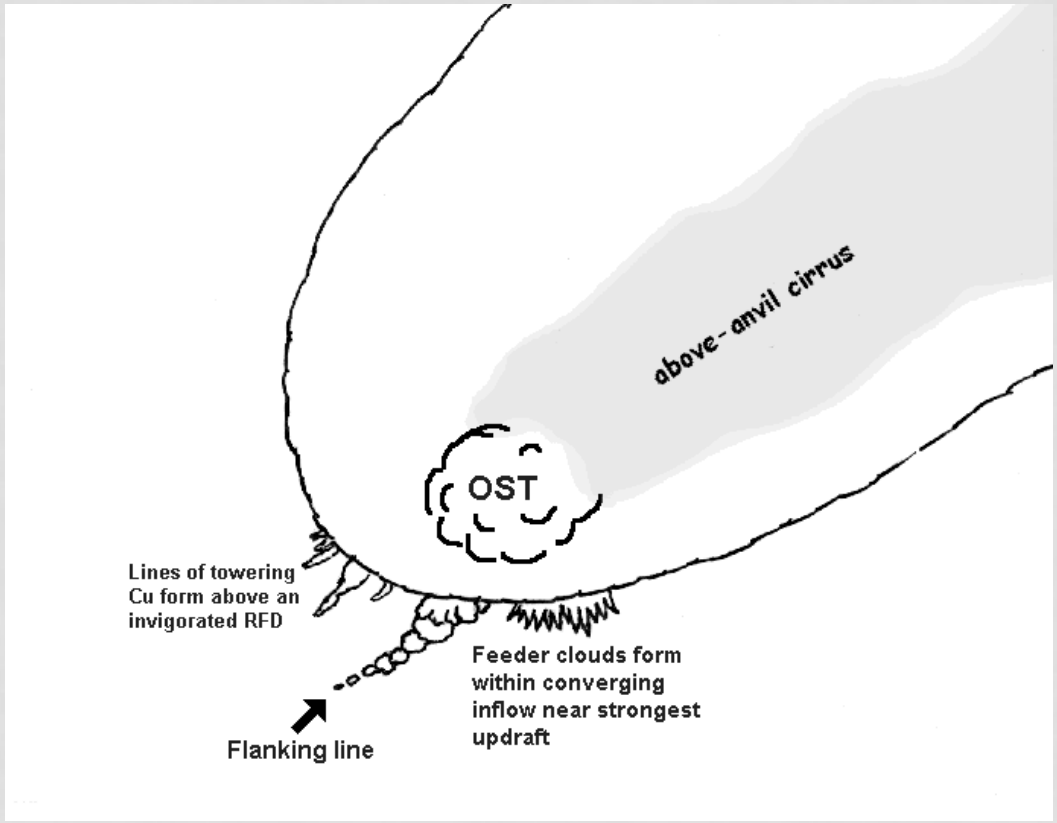
4 GOES 16 & 17 Mesosector images – August 29, 2018

GOES R APPLICATIONS FOR YOU

SEVERE CONVECTION

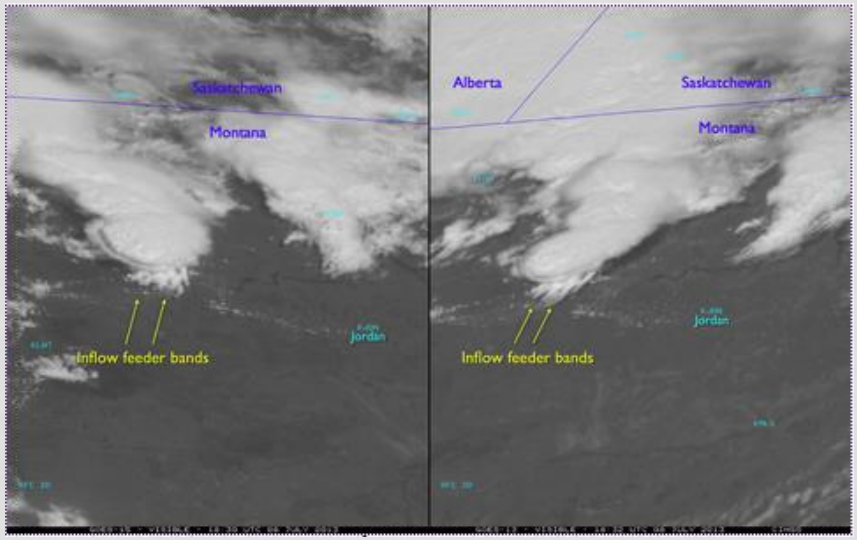


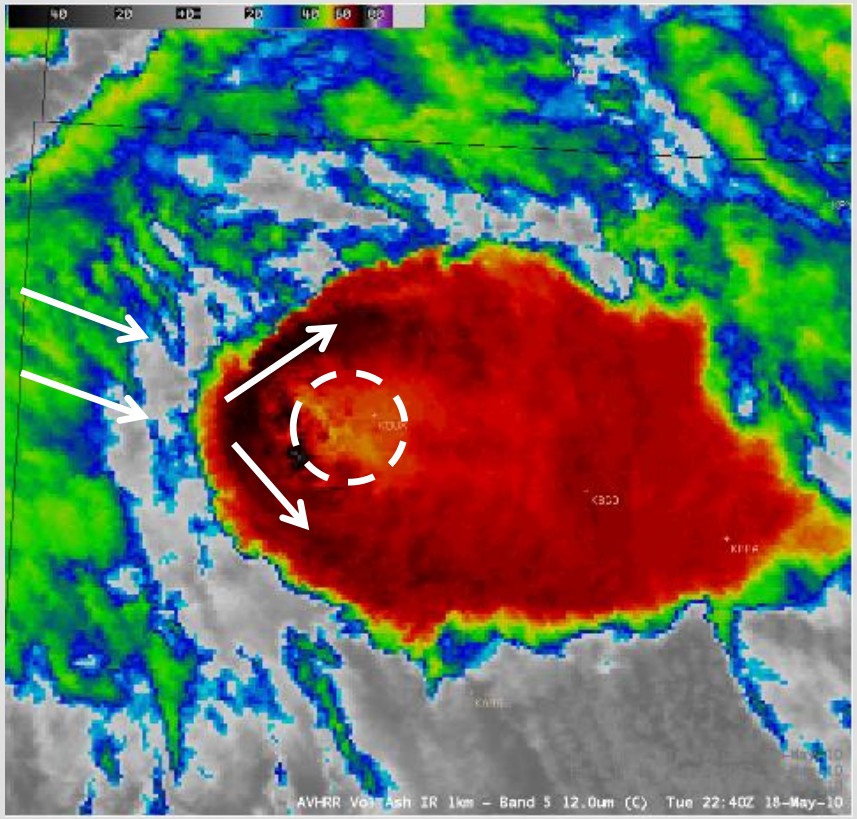




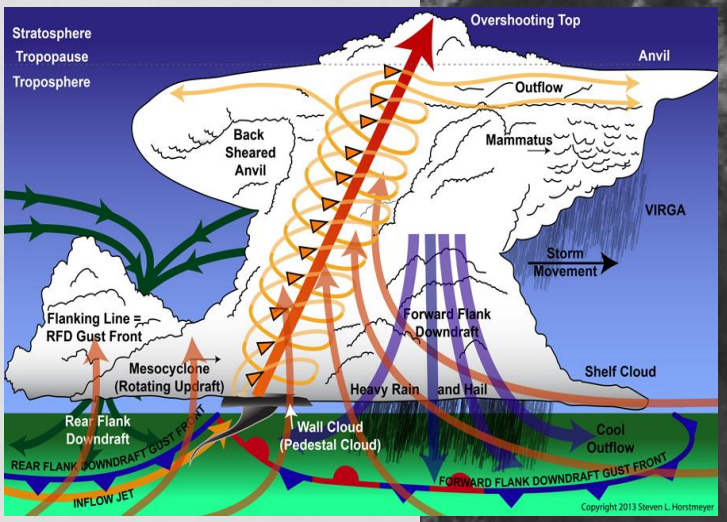
Feeder clouds = 77% chance that severe weather occurs within 30 minutes

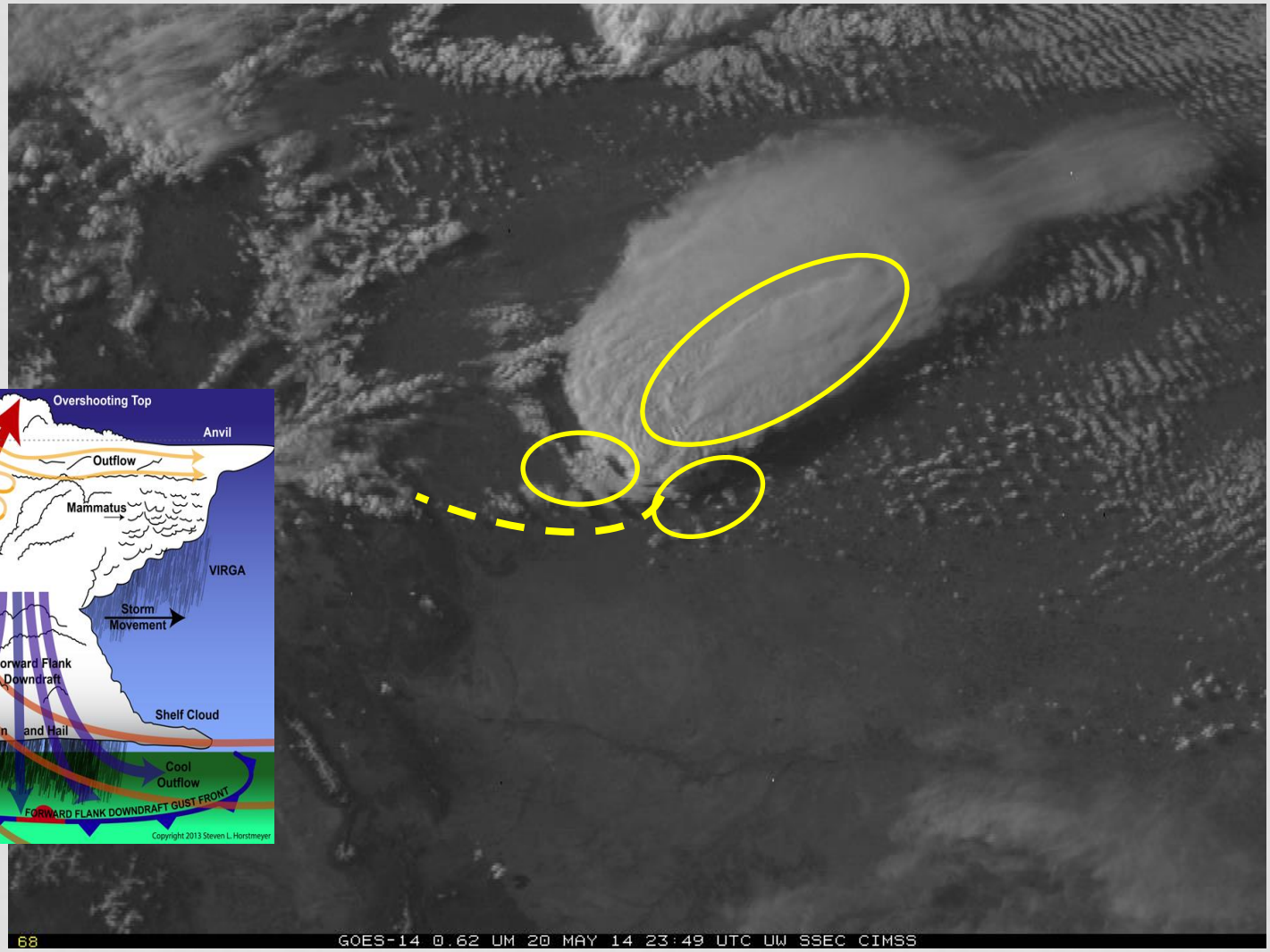
SEVERE CONVECTION



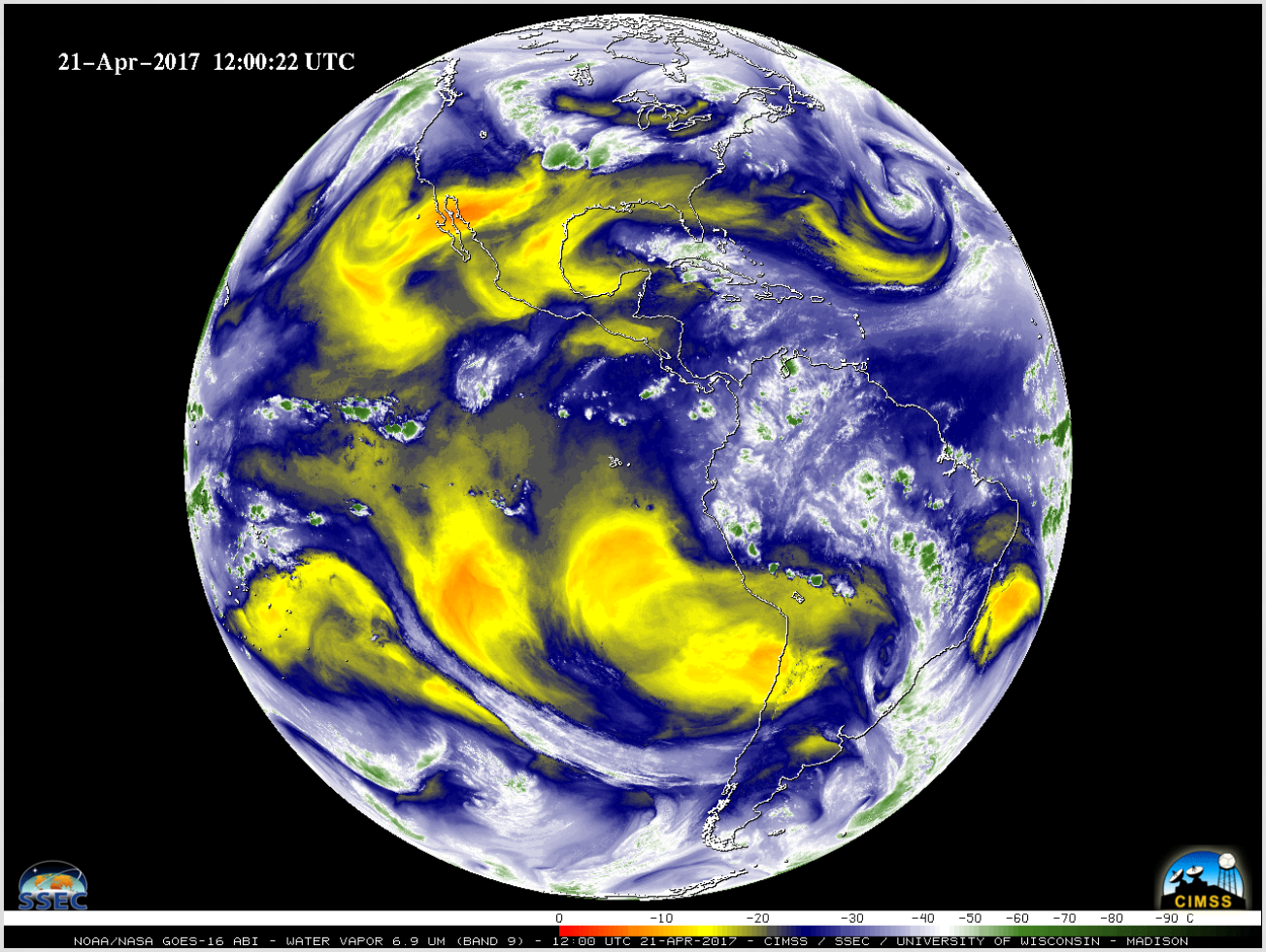


SEVERE CONVECTION



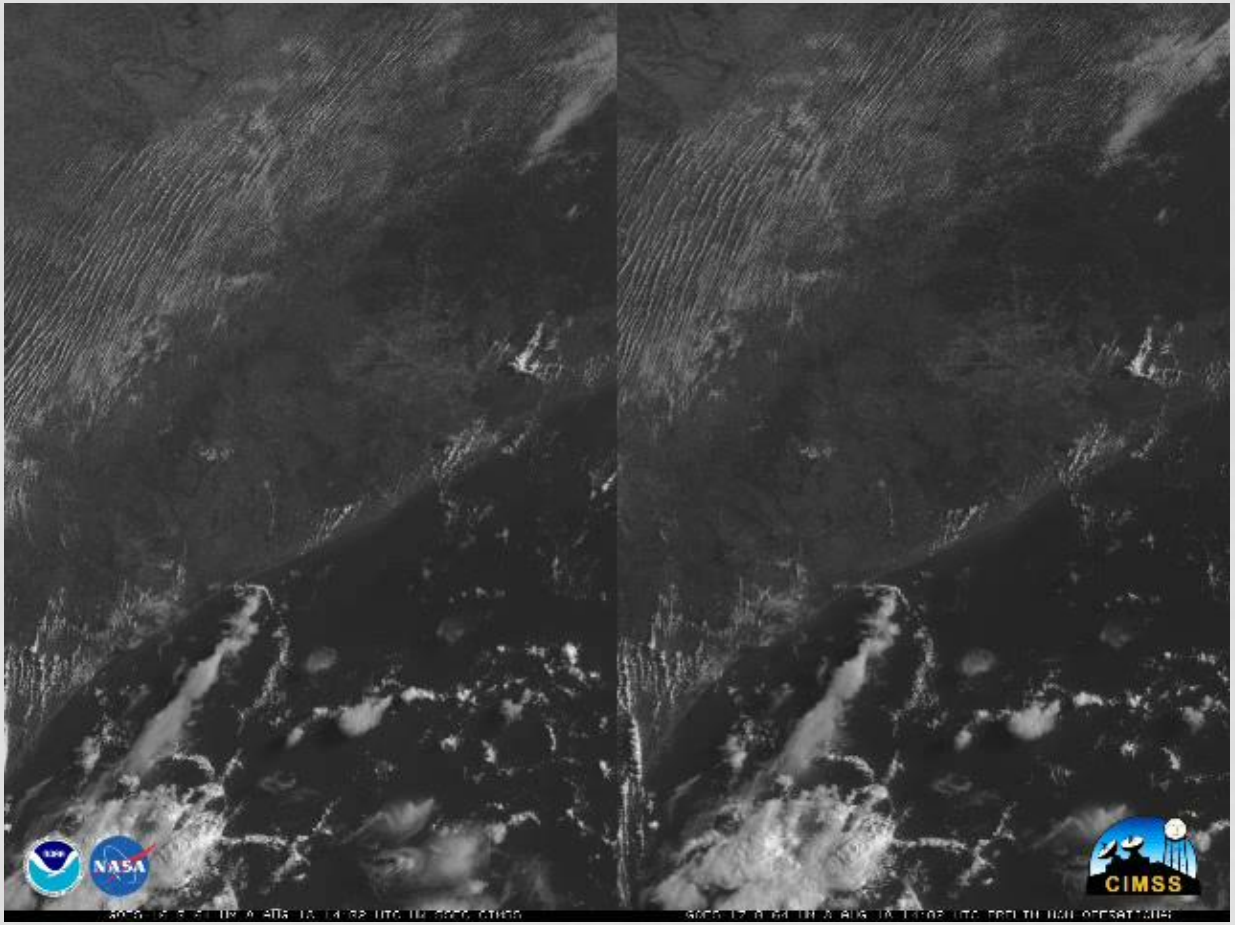


SEVERE CONVECTION



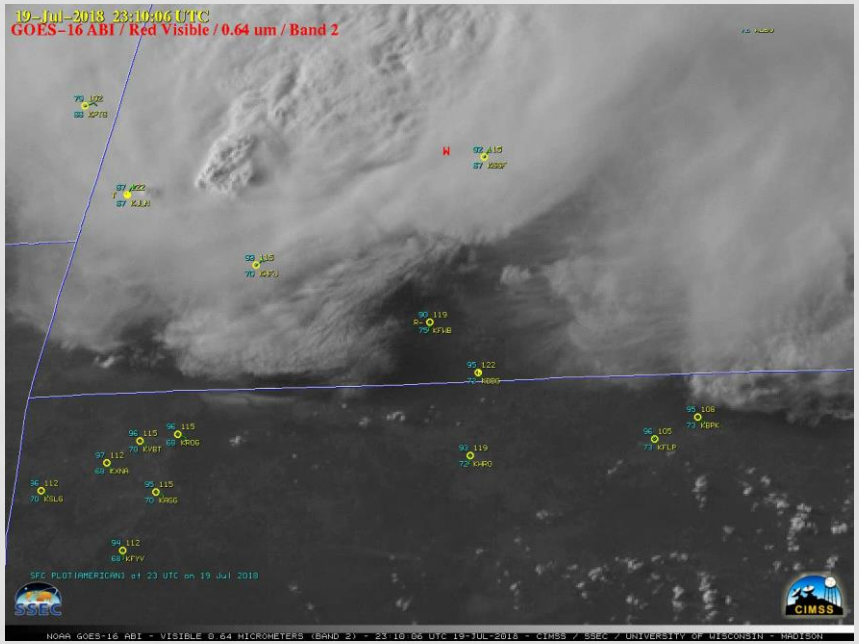
Application: "The Cap", May 16, 2017

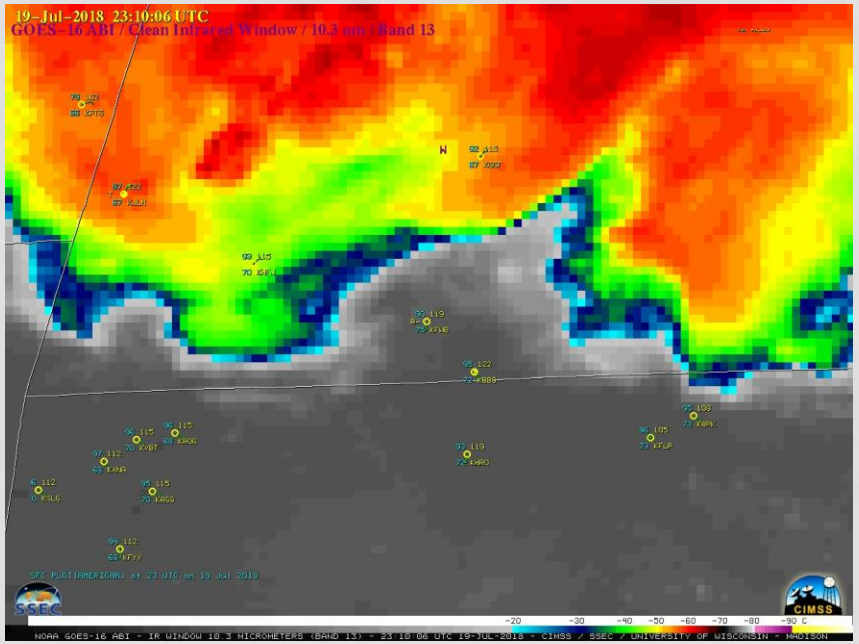
SEVERE CONVECTION



Storms developing on outflow boundaries – August 9, 2018

SEVERE CONVECTION





Severe Convection over Missouri – July 19, 2018

Rob Rogers ✓
@robrfs

Follow

This is the Sir Ivan fire about an hour ago. Danger not passed for local communities yet. #NSWRFS

RETWEETS 52 LIKES 39

12:25 AM - 12 Feb 2017

52 39

Rob Rogers ✓
@robrfs

Follow

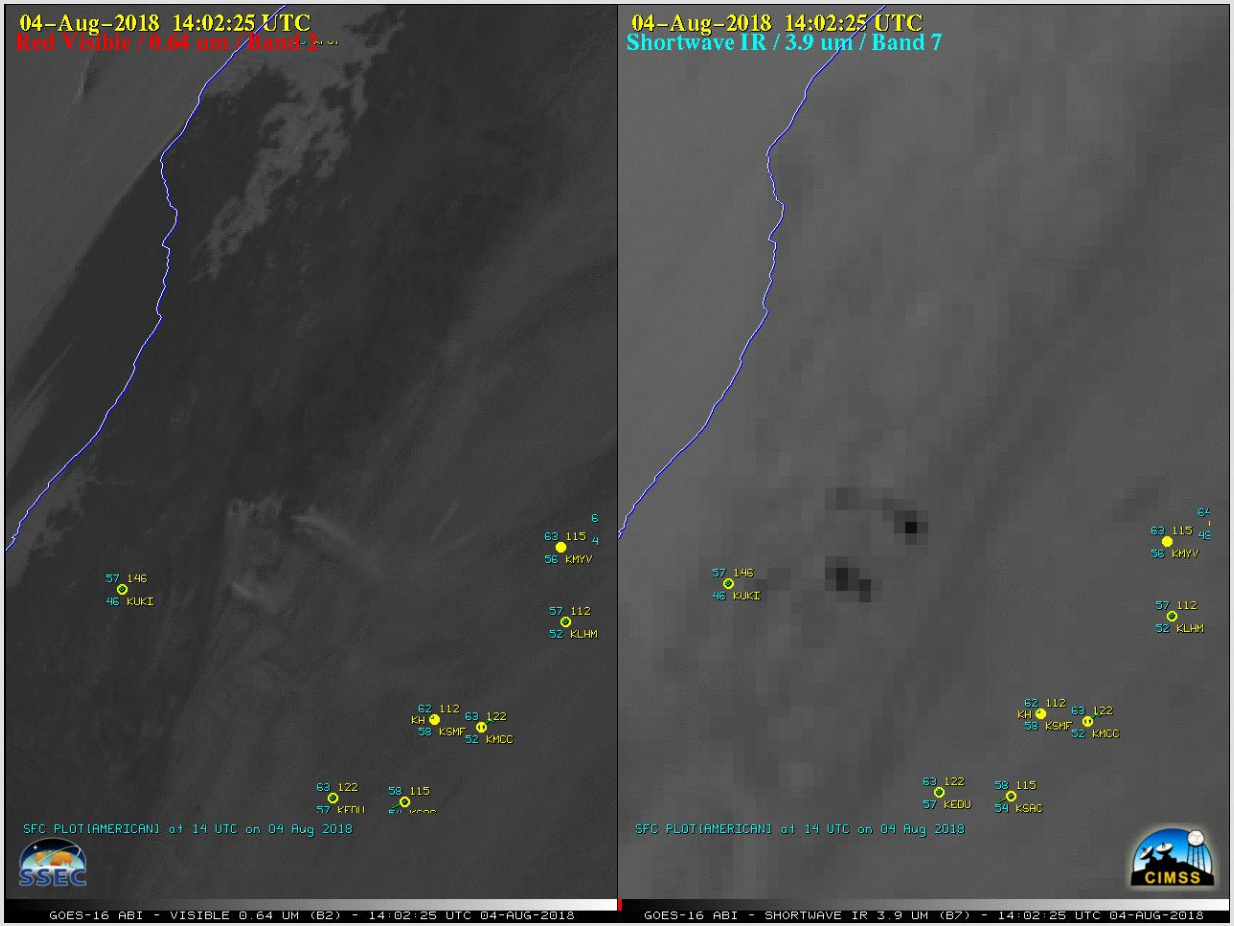
Sir Ivan fire from Dunedoo #NSWRFS

RETWEETS 112 LIKES 107

1:46 AM - 12 Feb 2017

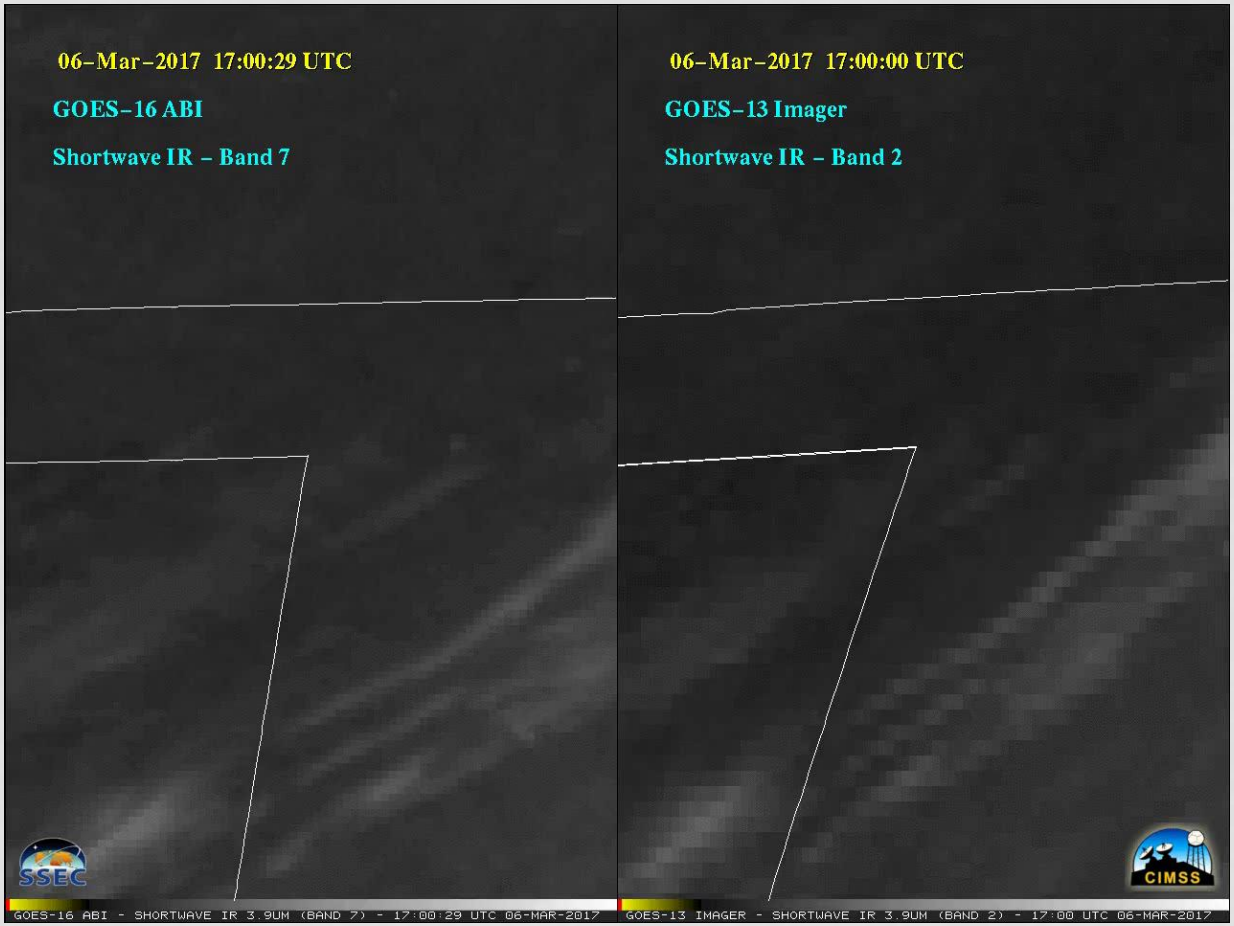
Sir Ivan Fire – New South Wales, Australia – February 12, 2017

CHANGES IN FIRE ACTIVITY



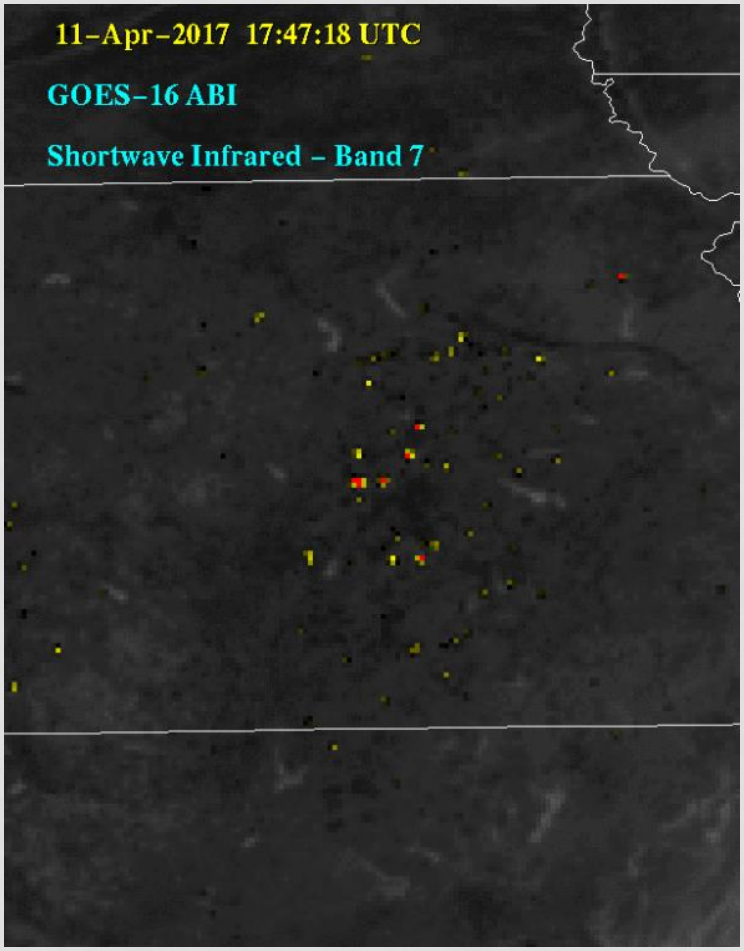
California Wildfires – August 4, 2018

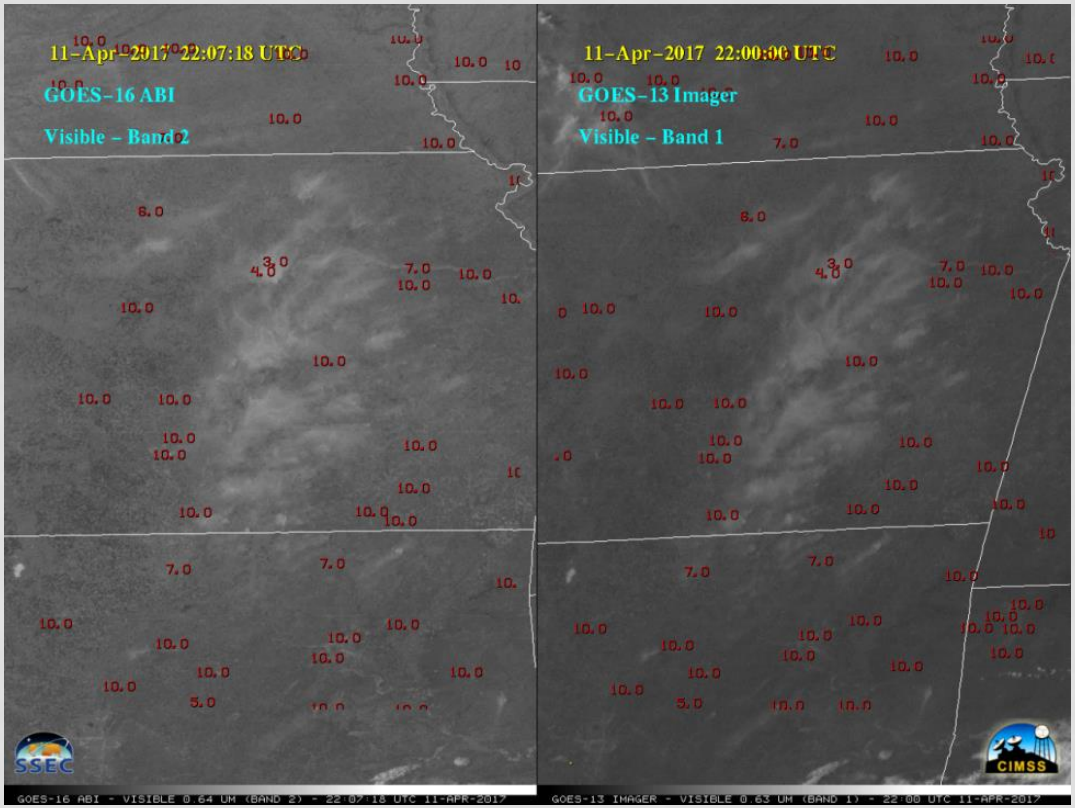
FIRE DIRECTION CHANGES



Wildfire Outbreak – March 6, 2017

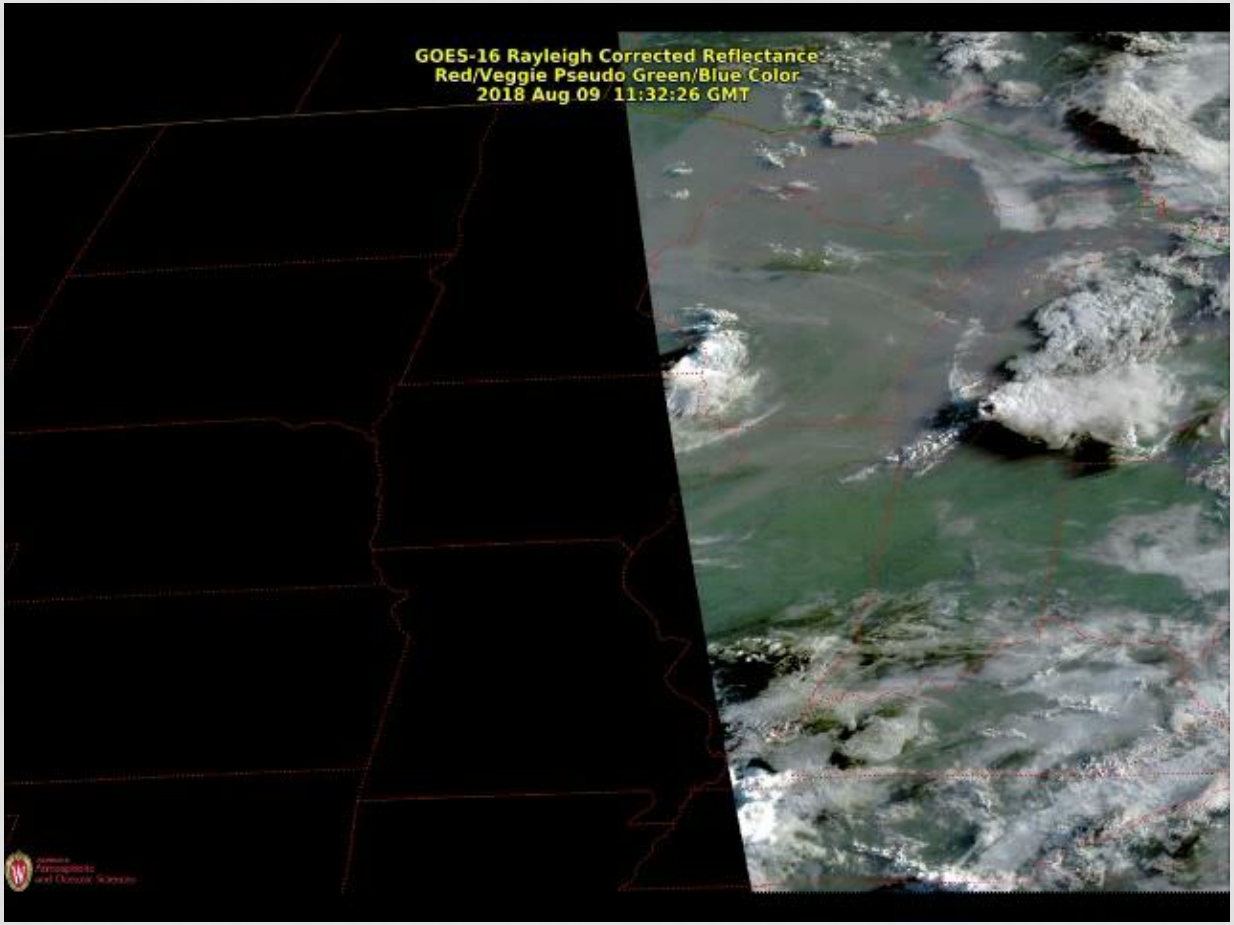
SMOKE MONITORING





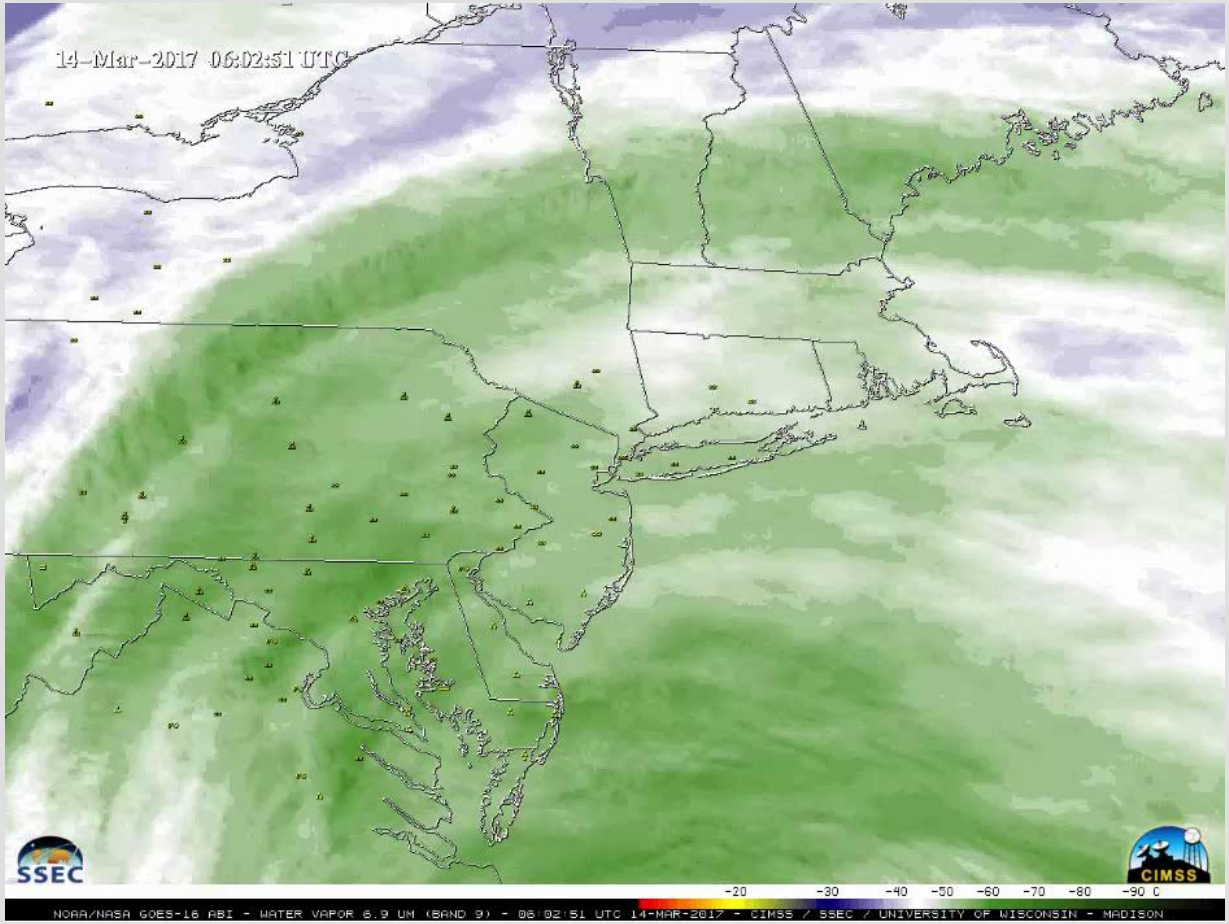
Prescribed burning in the Flint Hills – April 11, 2017

SMOKE MONITORING



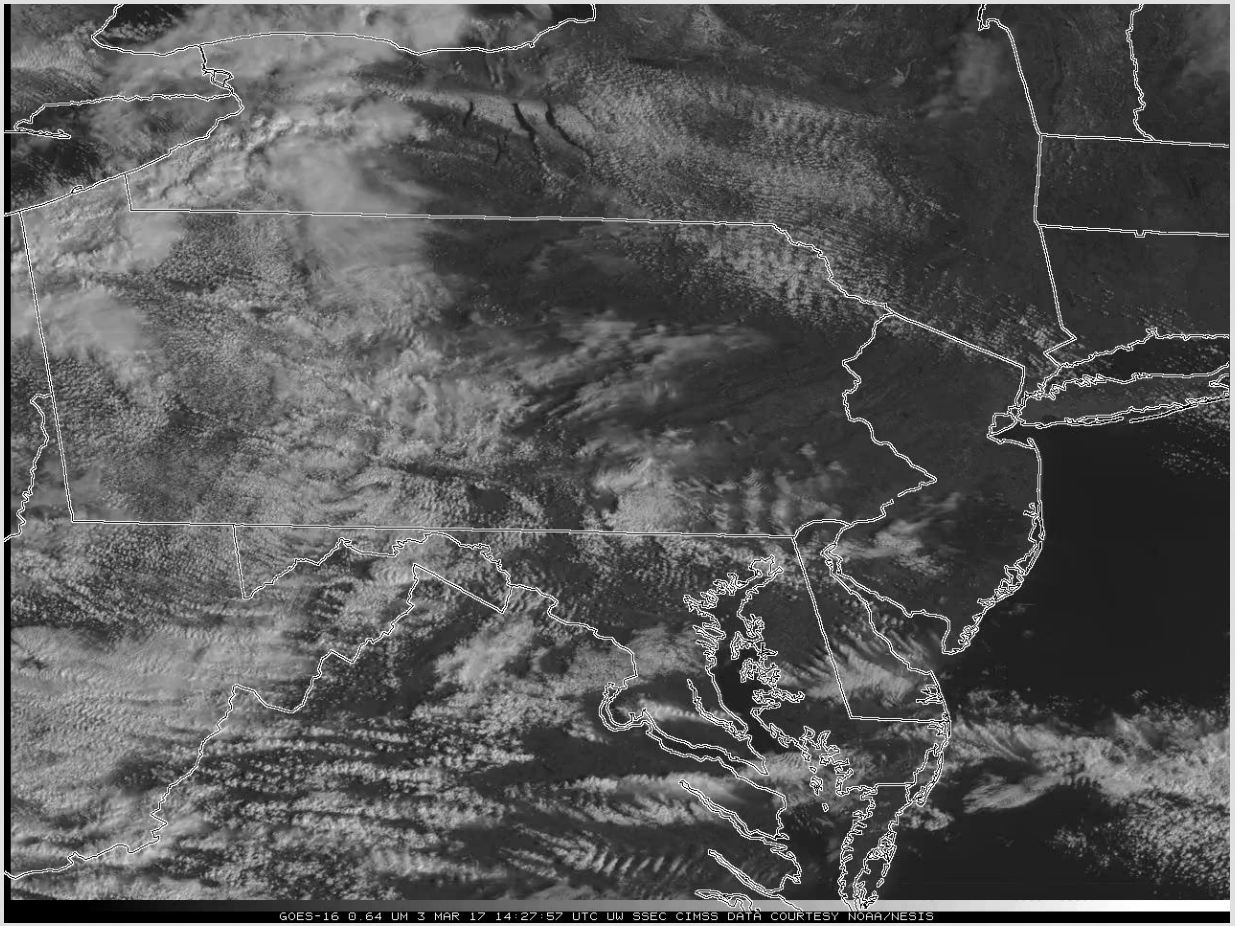
Great Plains Smoke (from NW US) – August 9th, 2018

WINTER WEATHER



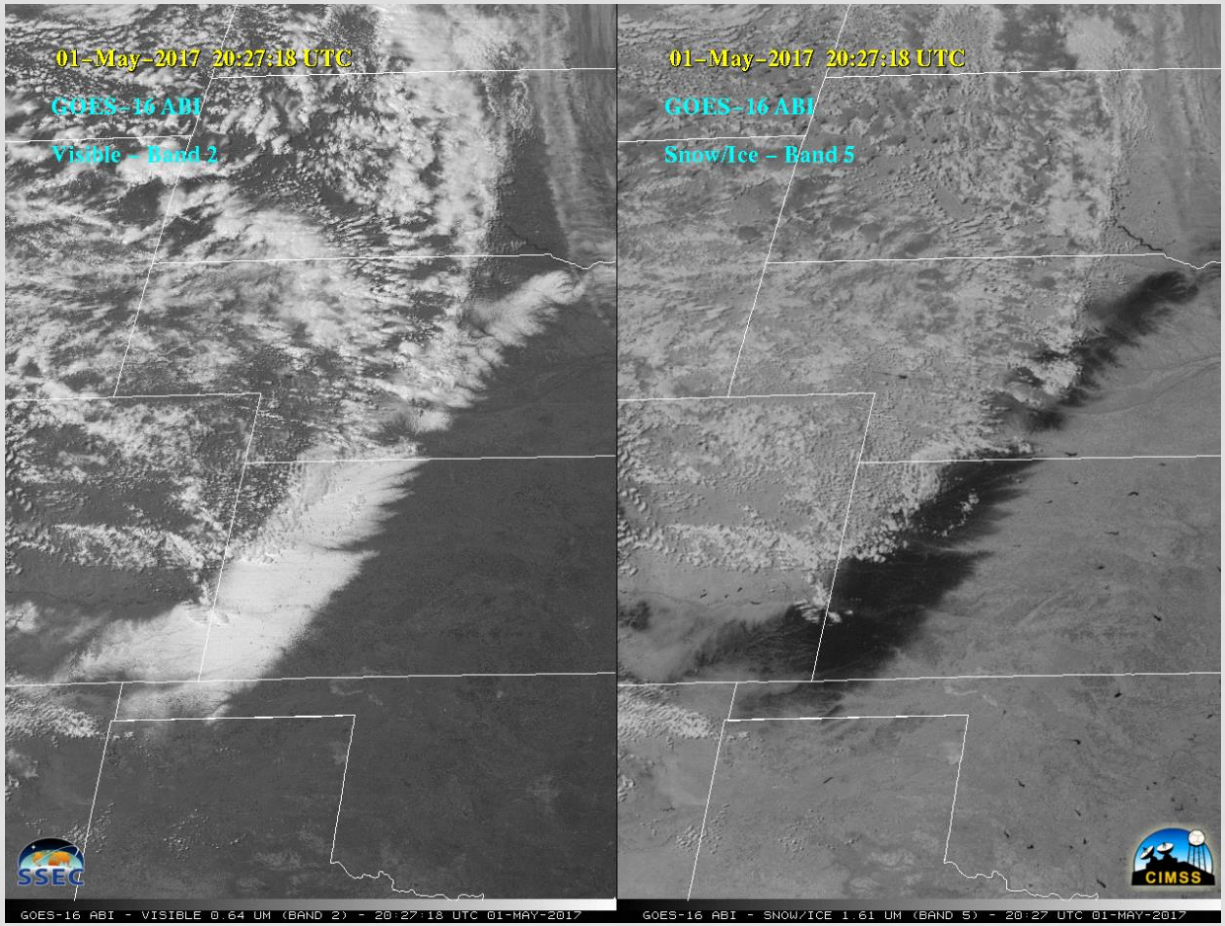
Winter Storm – March 14, 2017

WINTER WEATHER



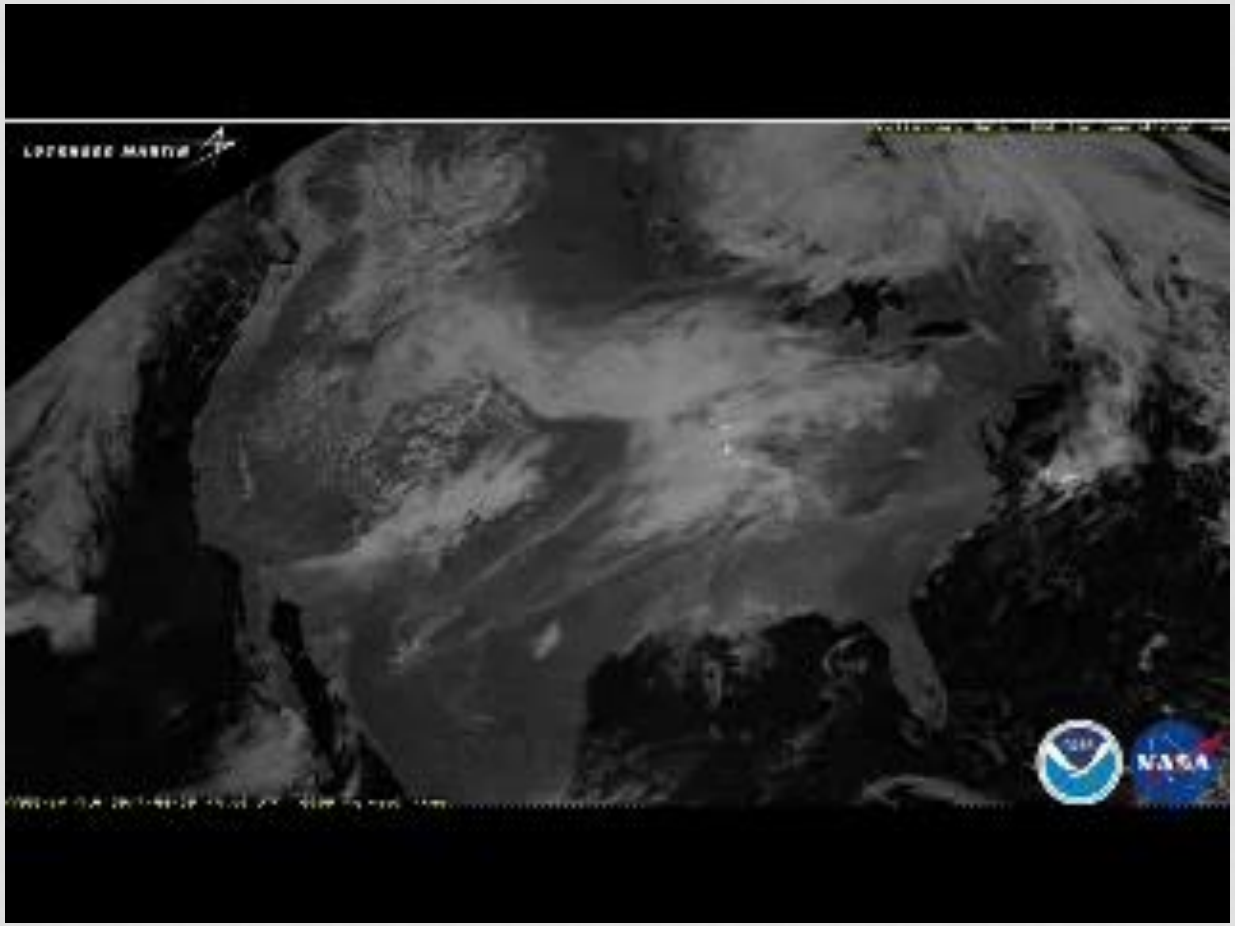
Snow Squalls – March 3, 2017

WINTER WEATHER



Remaining High Plains Snow – May 1, 2017

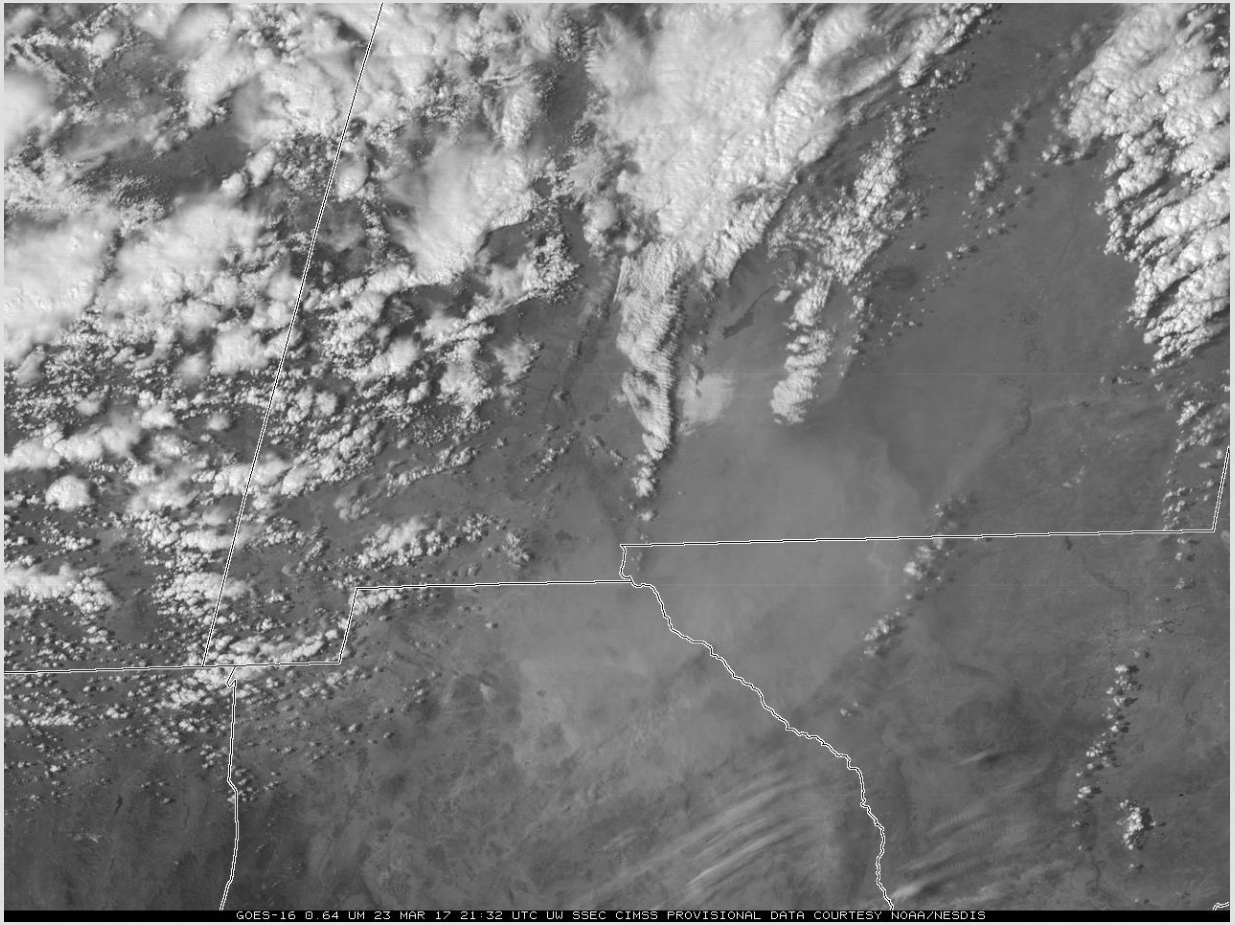
LIGHTNING



Lightning jumps in storms: POD – 79%, FAR – 36%, lead time increases 7 minutes

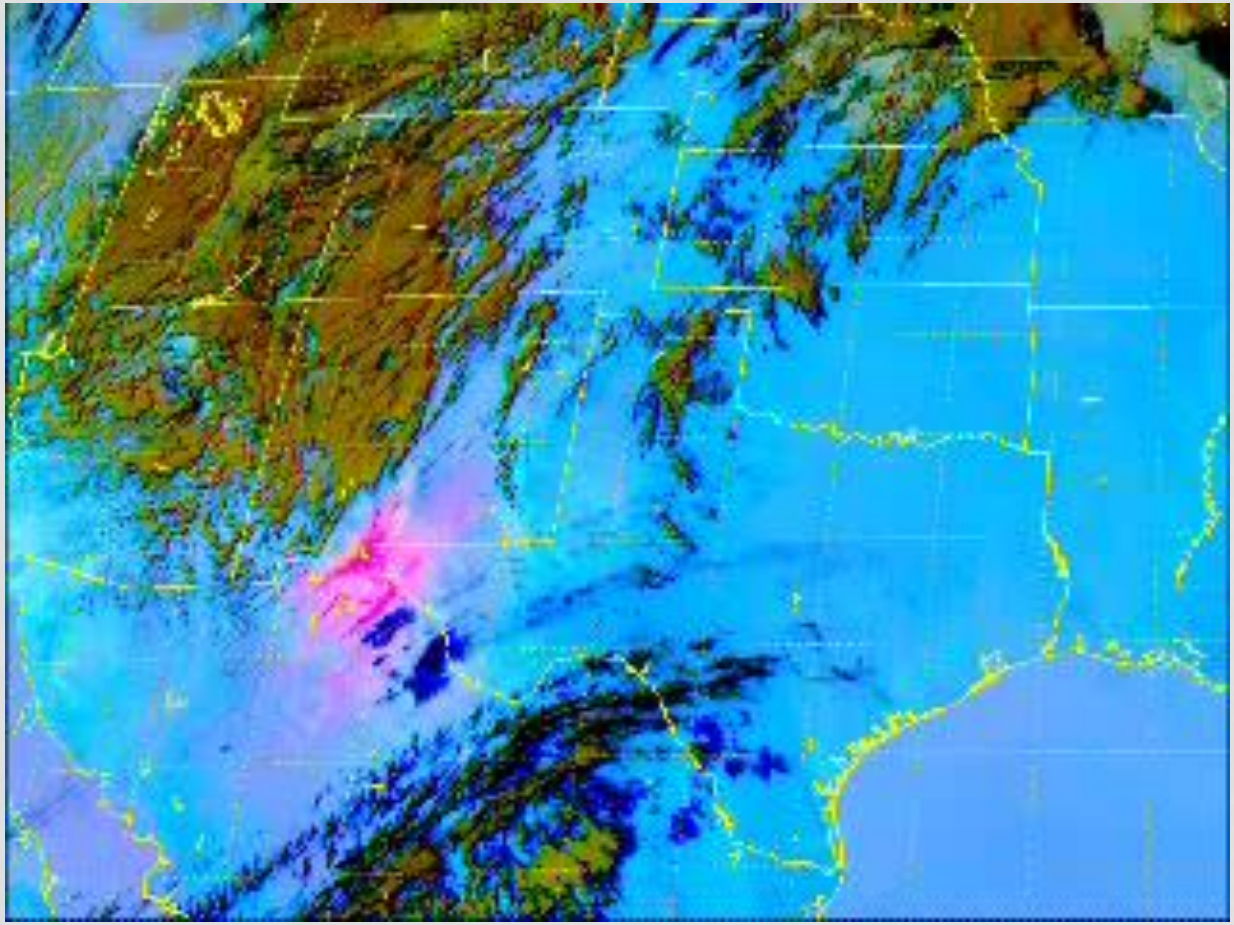
LIGHTNING

BLOWING DUST



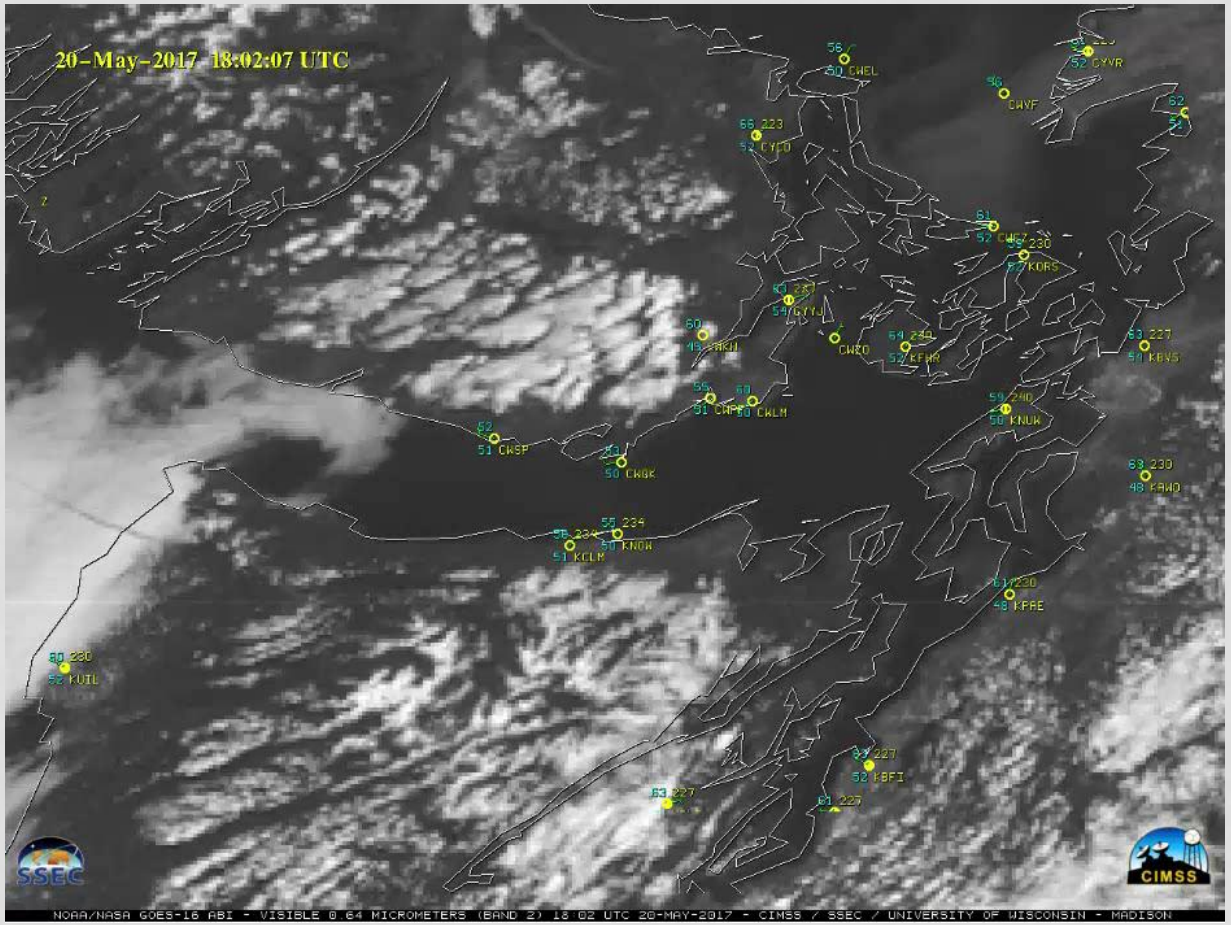
Blowing Dust in New Mexico, Texas, and Mexico – March 23, 2017

BLOWING DUST



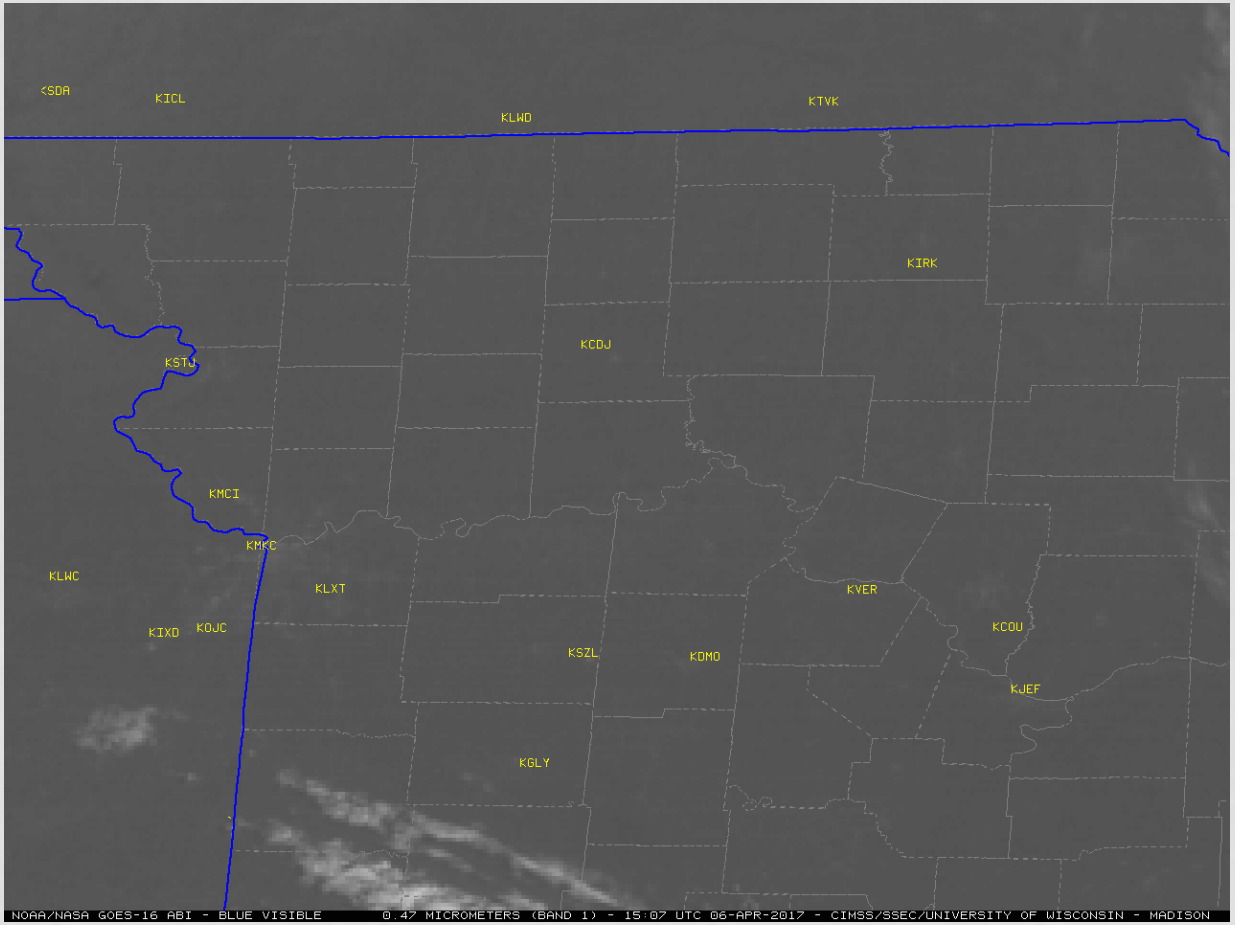
RGB (Red-Green-Blue) image: Dust (magenta/pink), thin cirrus (dark blue), Earth's surface (pale blue), denser cloud cover and storms (mustard/yellow)

FOG/STRATUS



Fog near Seattle, Washington (Straight of Juan de Fuca)

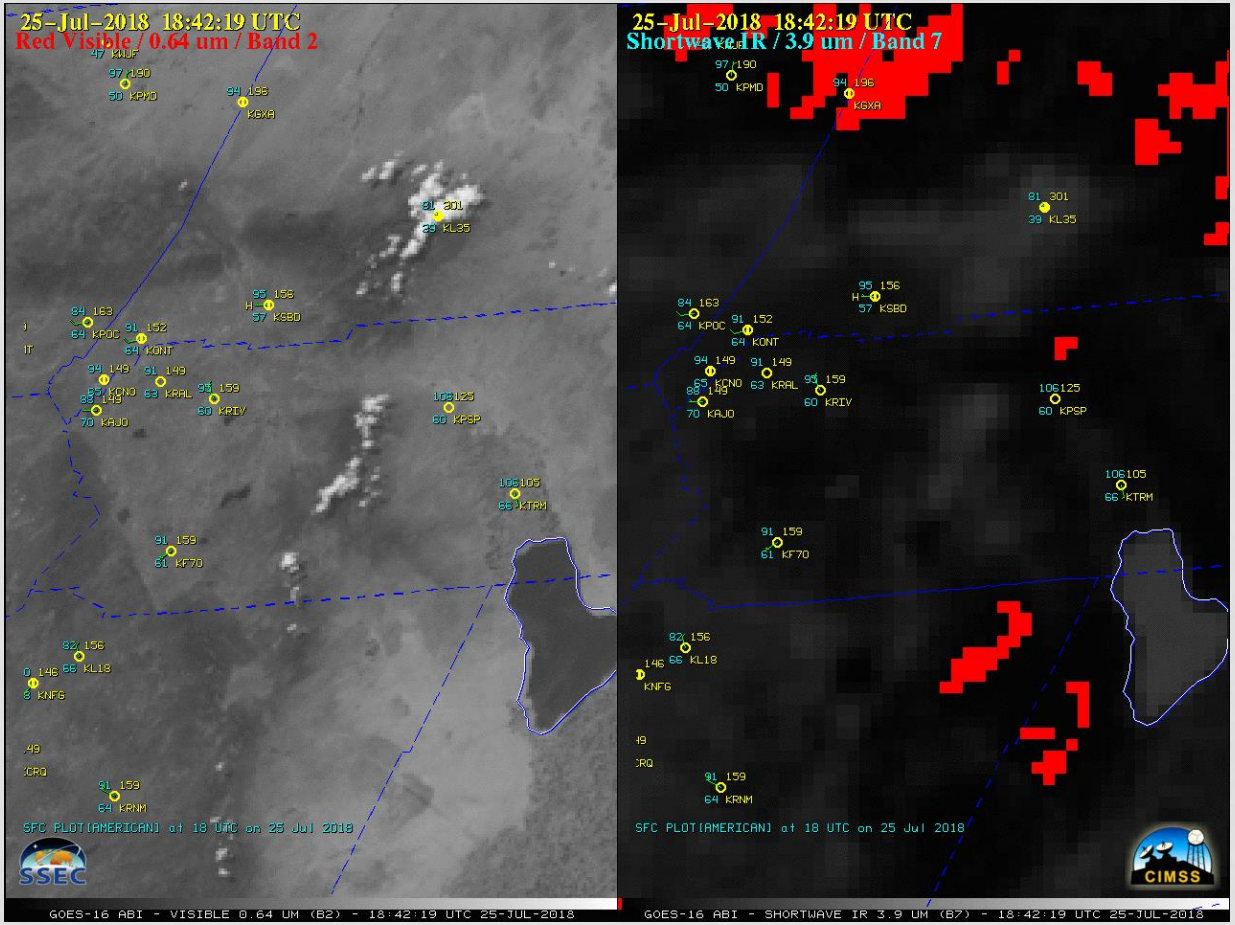
FLOOD MONITORING



Flooding over northwestern Missouri – April 6, 2017

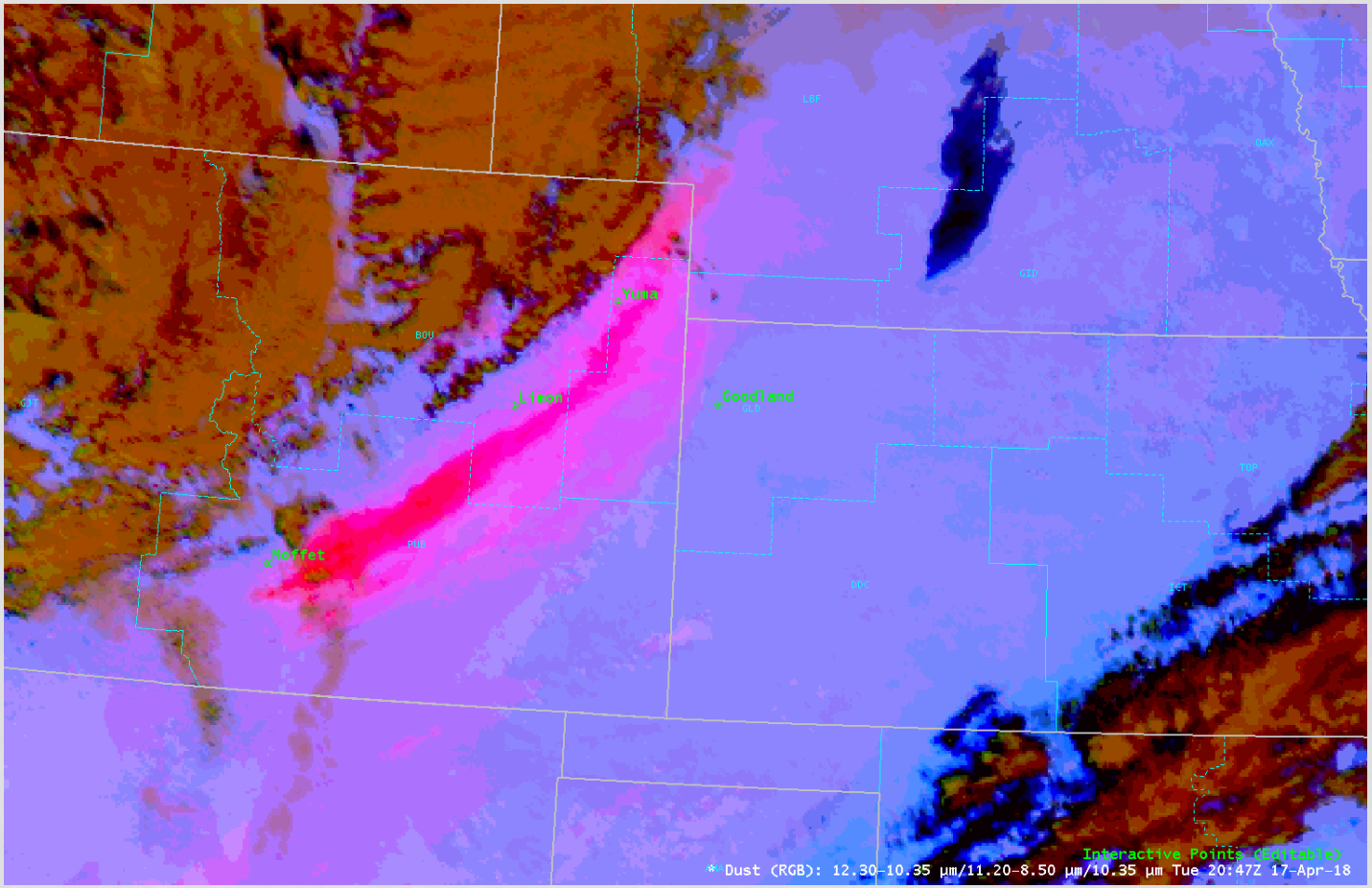
GOES R
USE WITH CAUTION

NOT WHAT IT SEEMS…



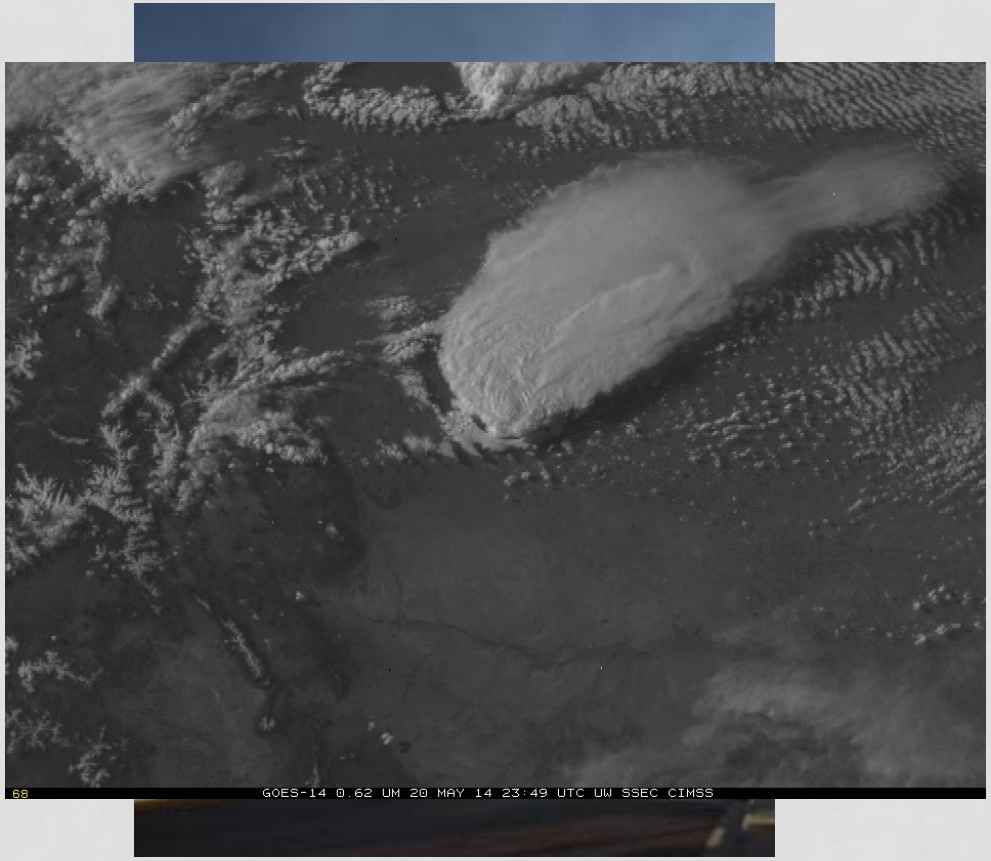
Hot Spots vs. Desert Reflection – July 25, 2018

NOT WHAT IT SEEMS…

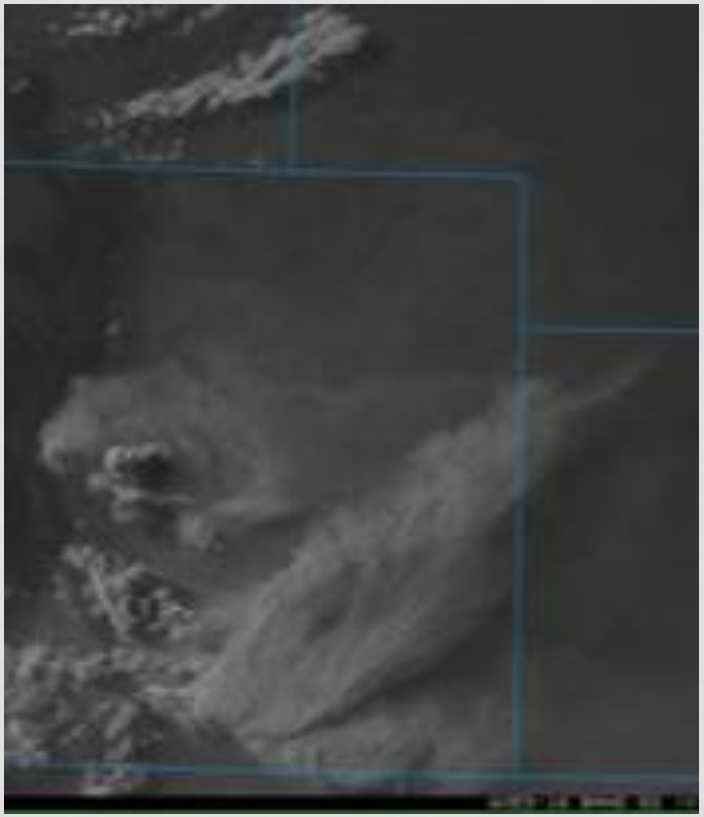


High Plains Dust – April 17, 2018

NOT WHAT IT SEEMS…



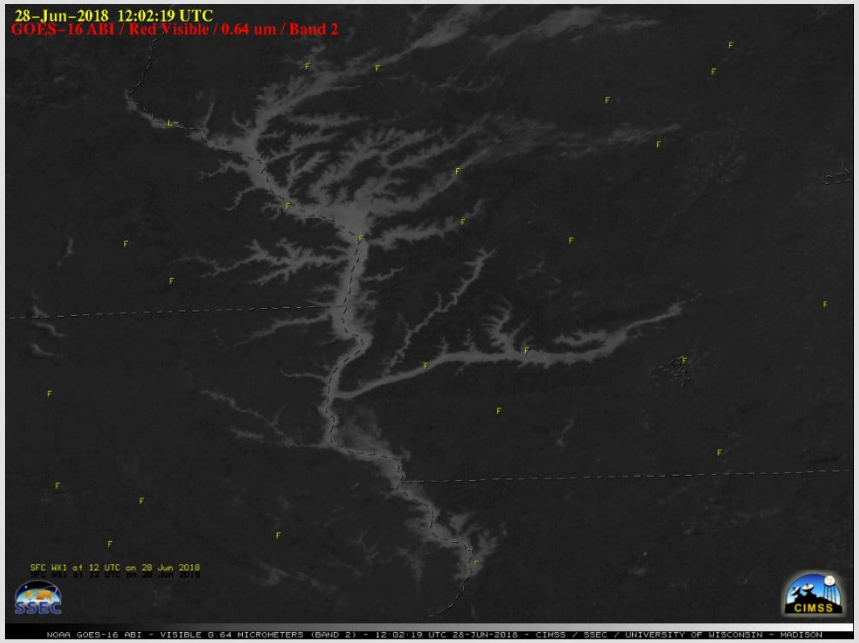
Thunderstorm



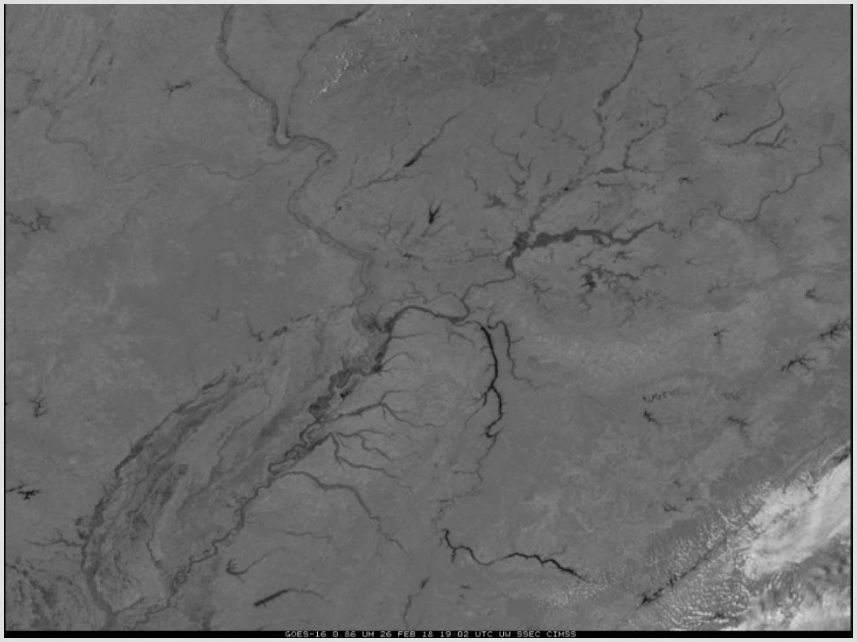
Pyrocumulus

NOT WHAT IT SEEMS…

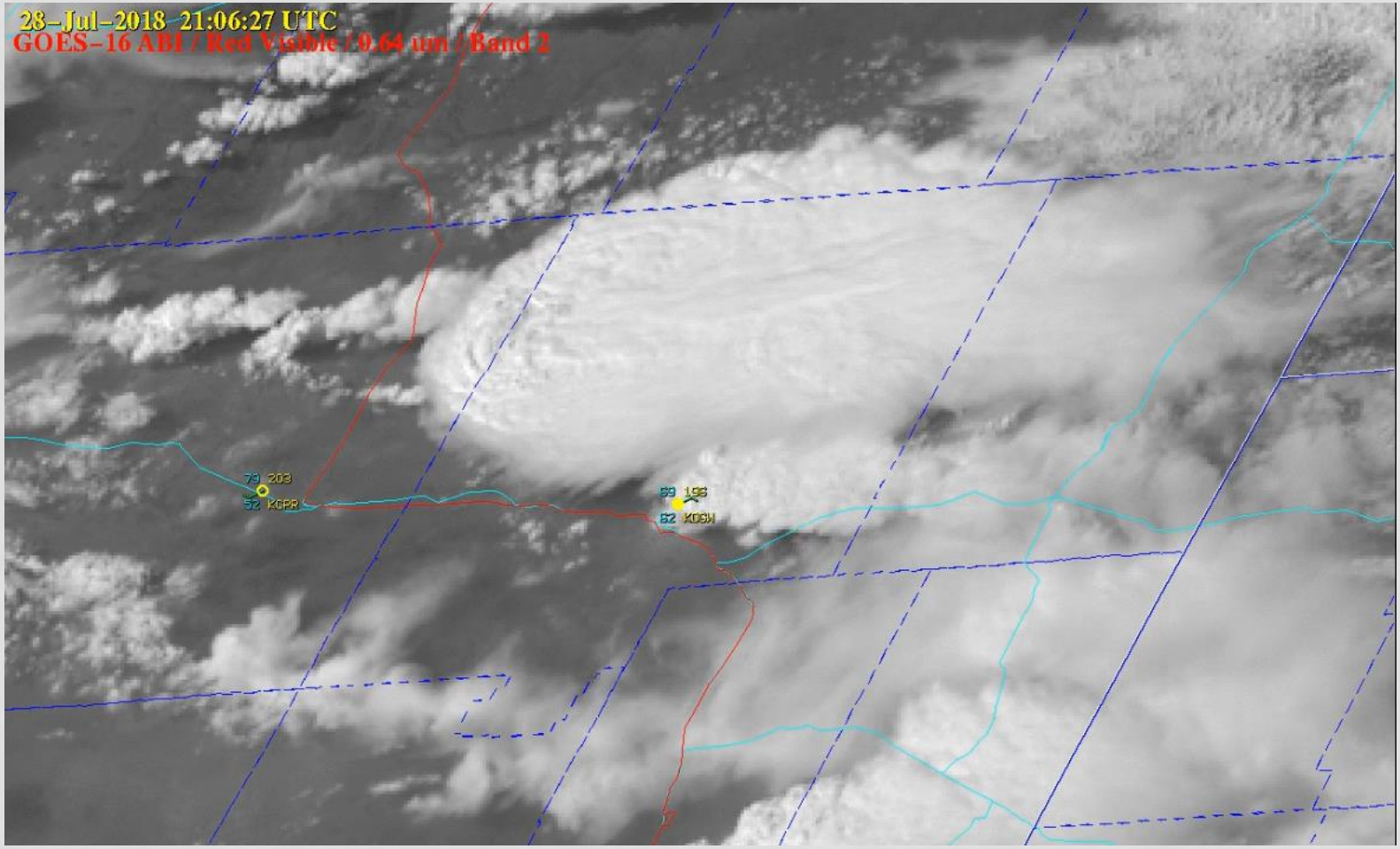
Valley Fog



Flooding

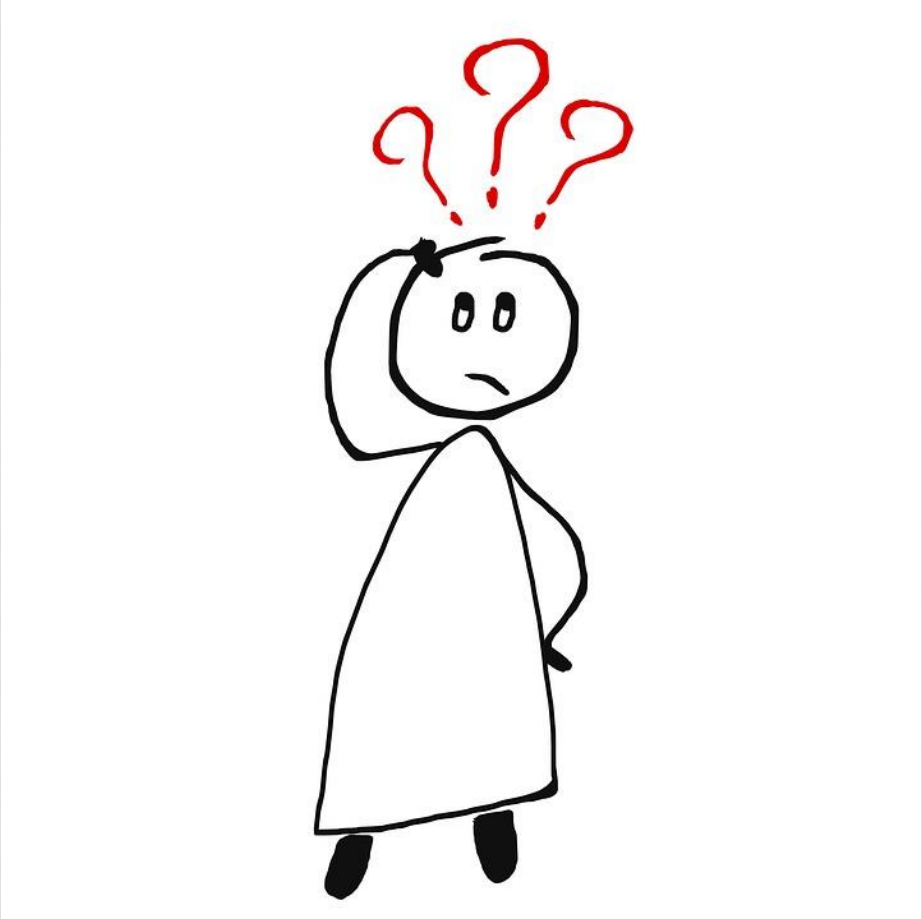


NOT WHAT IT SEEMS…



More typical tornadic storm over Wyoming– July 28, 2018

THANK YOU FOR STOPPING BY!



Any questions?