NASA GPM-ACCP Workshop

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UPS METEOROLOGY
In Support of
UPS Airlines
Worldwide.

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UPS Airlines Meteorology Role

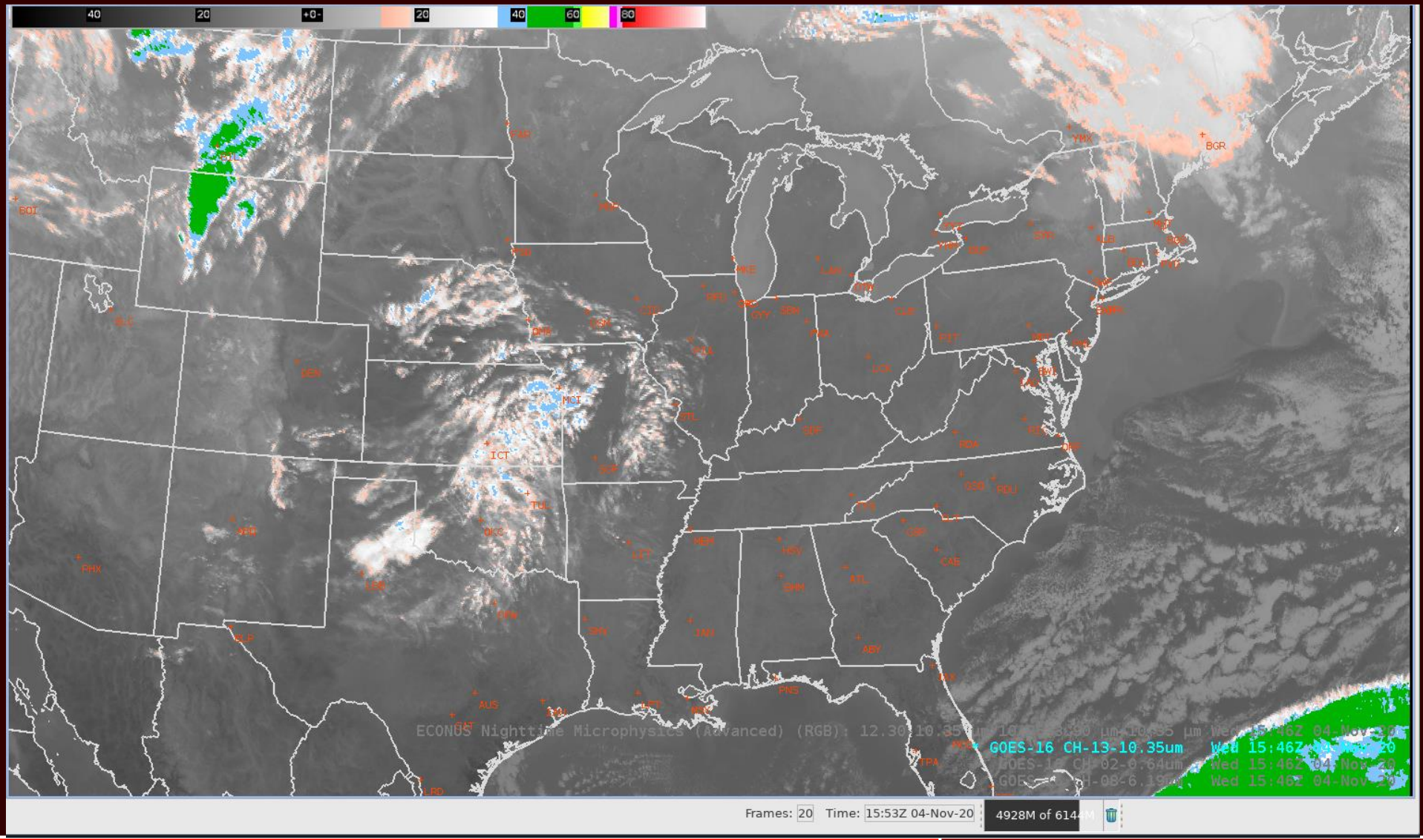
- Track weather at all UPS airports worldwide, prioritizing hubs
  - SDF, RFD, PHL, DFW, MIA, ONT, CGN, ANC, SZX, ICN
- High Winds
  - Crosswind, Cargo Door, Container Loading Limitations
- Winter Weather conditions for Deicing/Anti-icing including frost/frozen dew.
- Fog
- Thunderstorms (Enroute and at airport)
- Tropical Systems (Hurricanes/Typhoons/Tropical Cyclones)
- Supports airline packages (NDA, 2DA, 3DS) which can include truck movements
- Briefings for UPS Ground side for Tropical Storms/Hurricanes

Types of Satellite Data Used

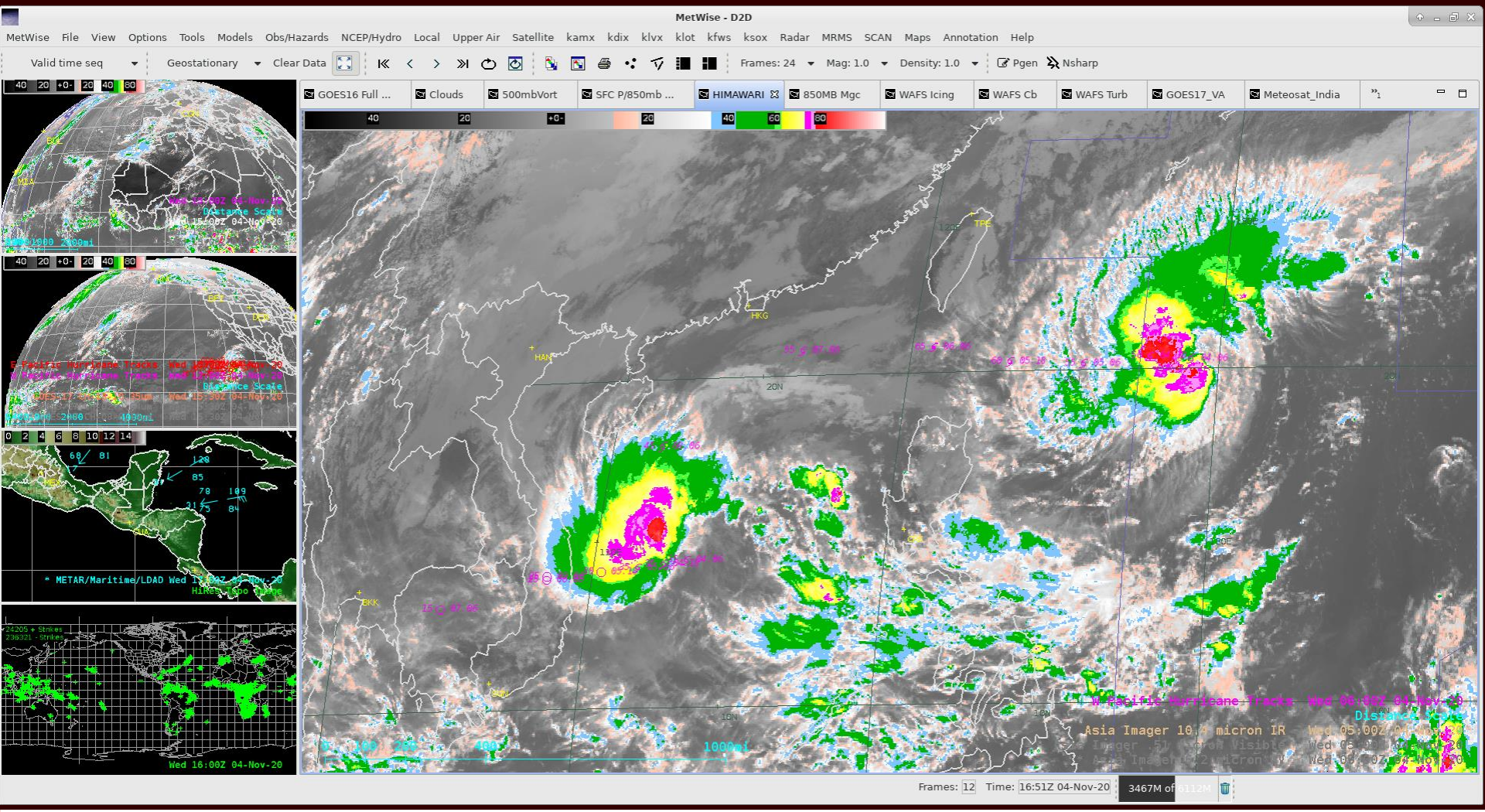
- Mainly GOES Data
  - GOES 16/17
  - Meteosat 8/10
  - Himawari

- IR Channel 10-11 micrometer
- WV Channel(s) 6-7 micrometer
- Visible 0.6 micrometer
- RGB Fog Imagery (Nighttime Microphysics)
- RGB VA Imagery
- Sea Surface Temperatures
- Sea Surface Winds (ASCAT) – Polar orbiting satellite

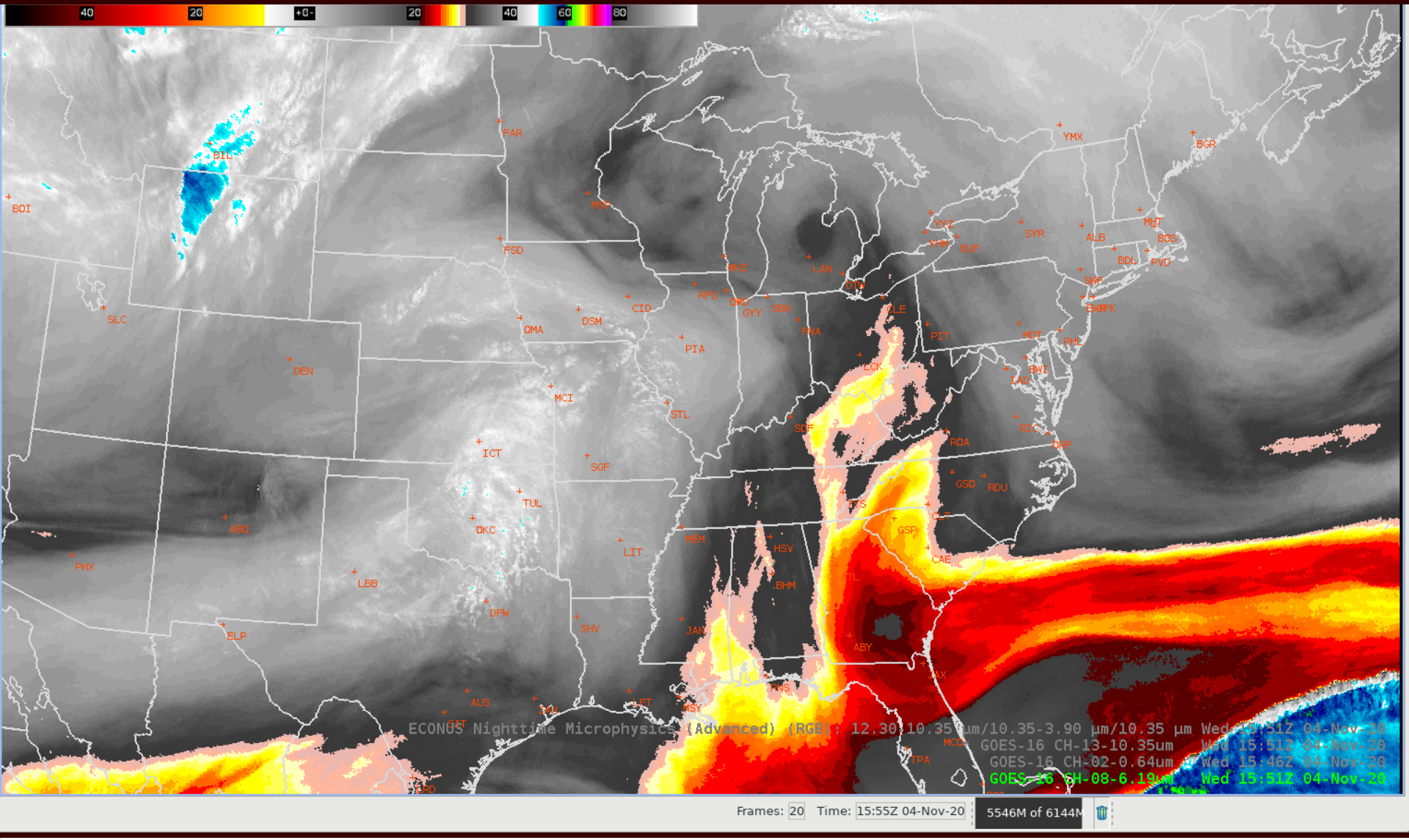
IR Imagery


40
20
+0-
20
40
60
80
ECONUS Nighttime Microphysics (Advanced) (RGB): 12.30 10.35 μm
GOES-16 CH-13-10.35um
Wed 15:46Z 04-Nov-20
Frames: 20
Time: 15:53Z 04-Nov-20
4928M of 6144M

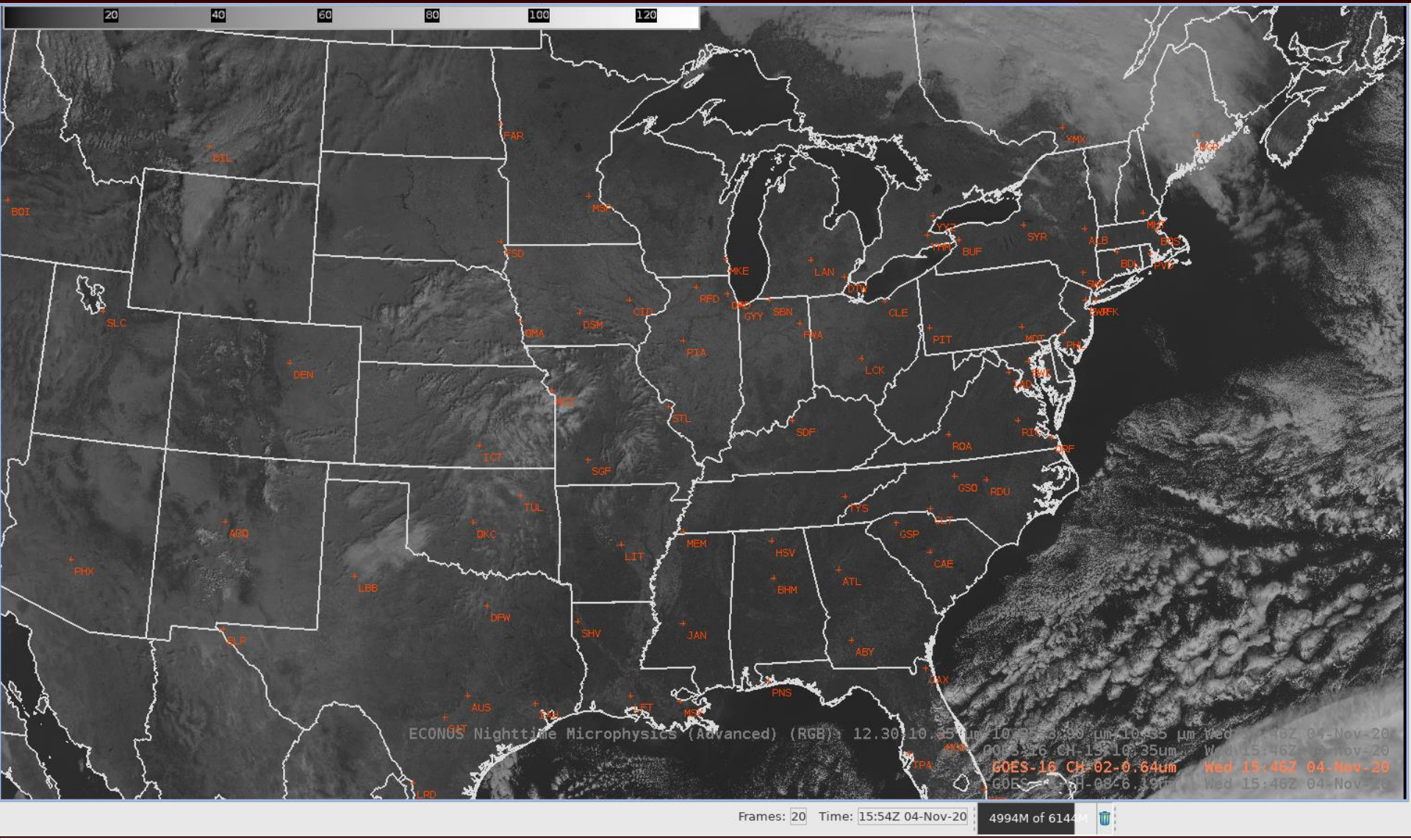
IR Imagery


MetWise - D2D
MetWise File View Options Tools Models Obs/Hazards NCEP/Hydro Local Upper Air Satellite kamx kdix klvx klot kfws ksox Radar MRMS SCAN Maps Annotation Help
Valid time seq
Geostationary
Clear Data
Frames: 24
Mag: 1.0
Density: 1.0
Pgen
Nsharp
GOES16 Full ...
Clouds
500mbVort
SFC P/850mb ...
HIMAWARI
850MB Mgc
WAFS Icing
WAFS Cb
WAFS Turb
GOES17_VA
Meteosat_India
Asia Imager 10.4 micron IR
Frames: 12
Time: 16:51Z 04-Nov-20

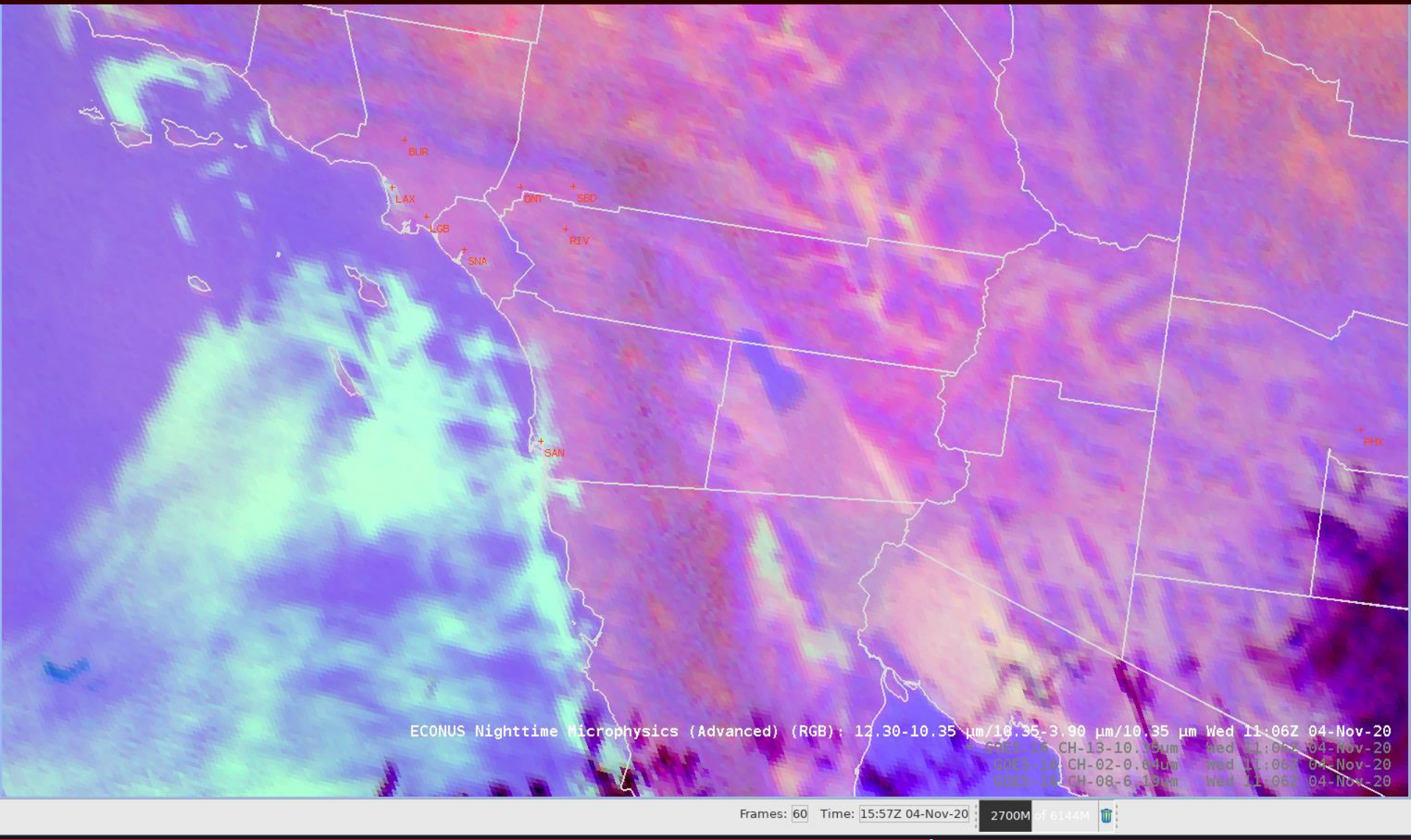
WV Imagery


ECONUS Nighttime Microphysics (Advanced) (RGB): 12.30-10.35 µm/10.35-3.90 µm/10.35 µm Wed 15:51Z 04-Nov-20
GOES-16 CH-13-10.35um Wed 15:51Z 04-Nov-20
GOES-16 CH-02-0.64um Wed 15:46Z 04-Nov-20
GOES-16 CH-08-6.19um Wed 15:51Z 04-Nov-20
Frames: 20 Time: 15:55Z 04-Nov-20
5546M of 6144M

Visible Imagery



RGB -Nighttime Microphysics (Fog)

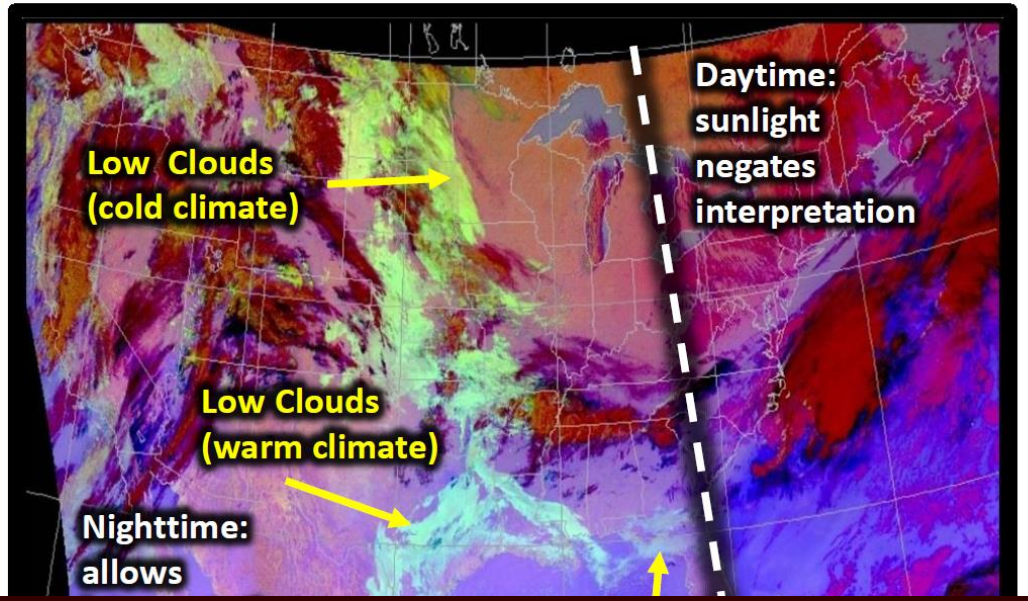


Nighttime Microphysics RGB

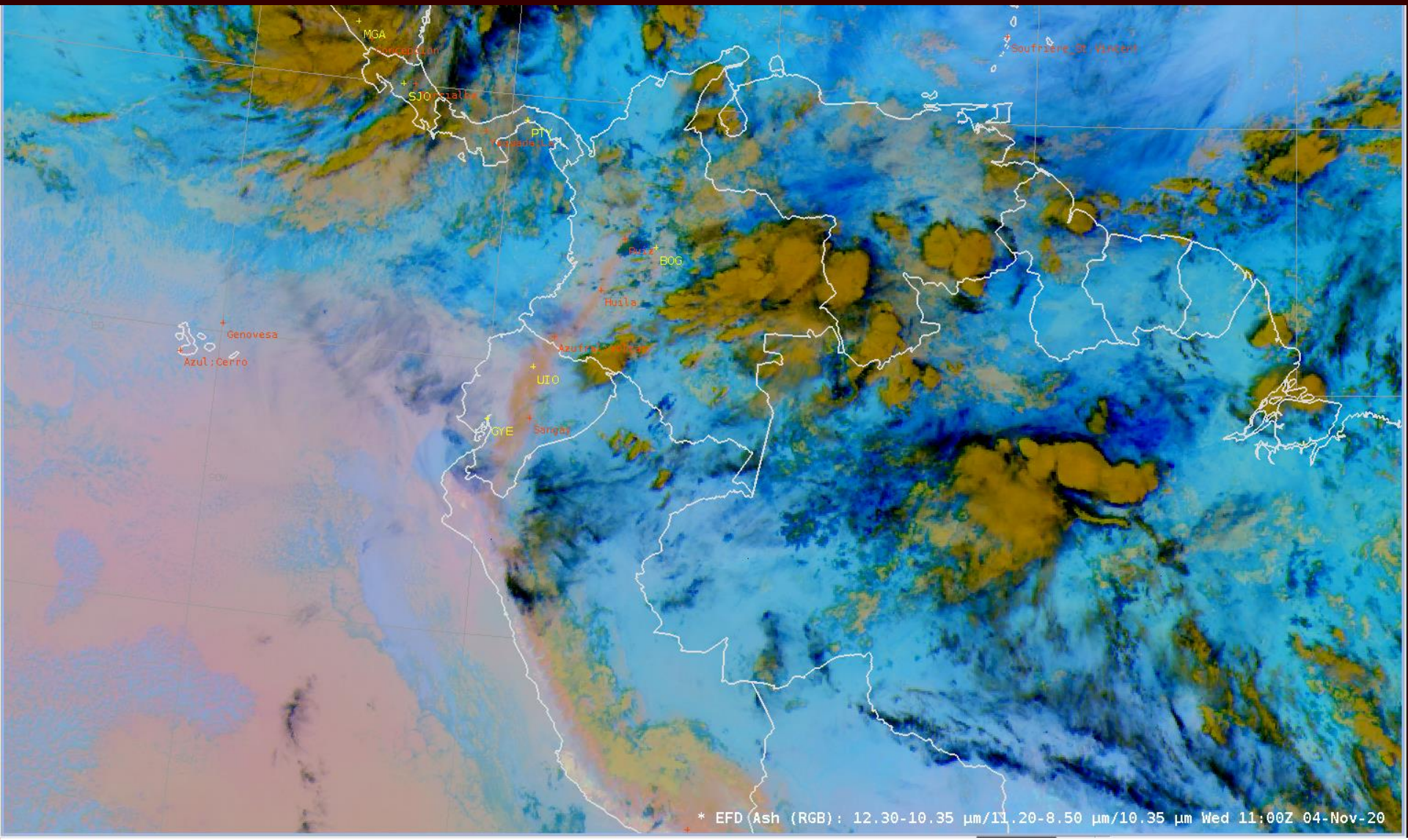
Quick Guide

Why is the Nighttime Microphysics RGB Imagery Important?

The distinction between low clouds and fog in satellite imagery is often a challenge. While the difference in the 10.4 and 3.9 µm channels has been a regularly applied product to meet aviation forecast needs, the Nighttime Microphysics (NtMicro) RGB adds another channel difference (12.4- 10.4 µm) as a proxy to cloud thickness and repeats the use of the 10.4 µm thermal channel to enhance areas of warm (i.e. low) clouds where fog is more likely. The



RGB VA Imagery

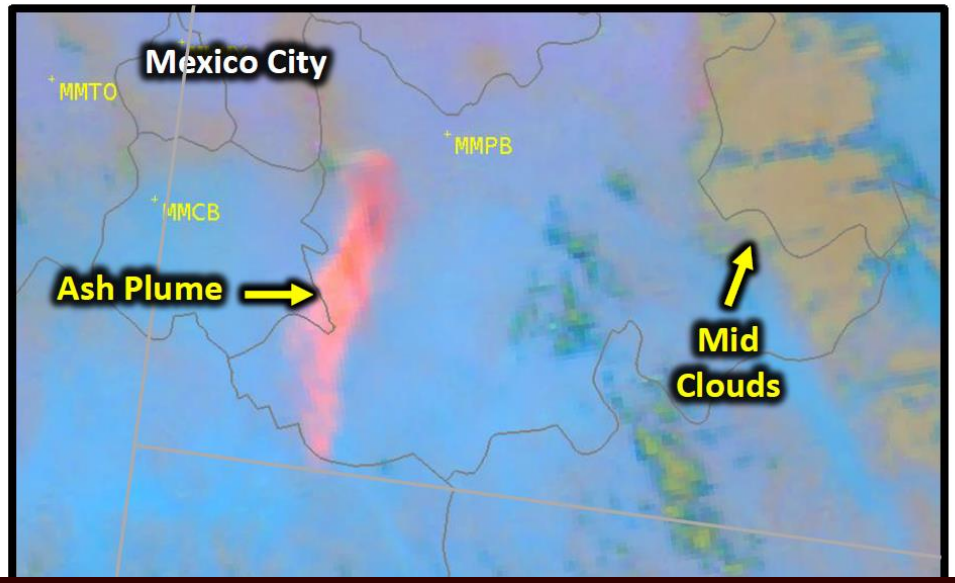


Ash RGB

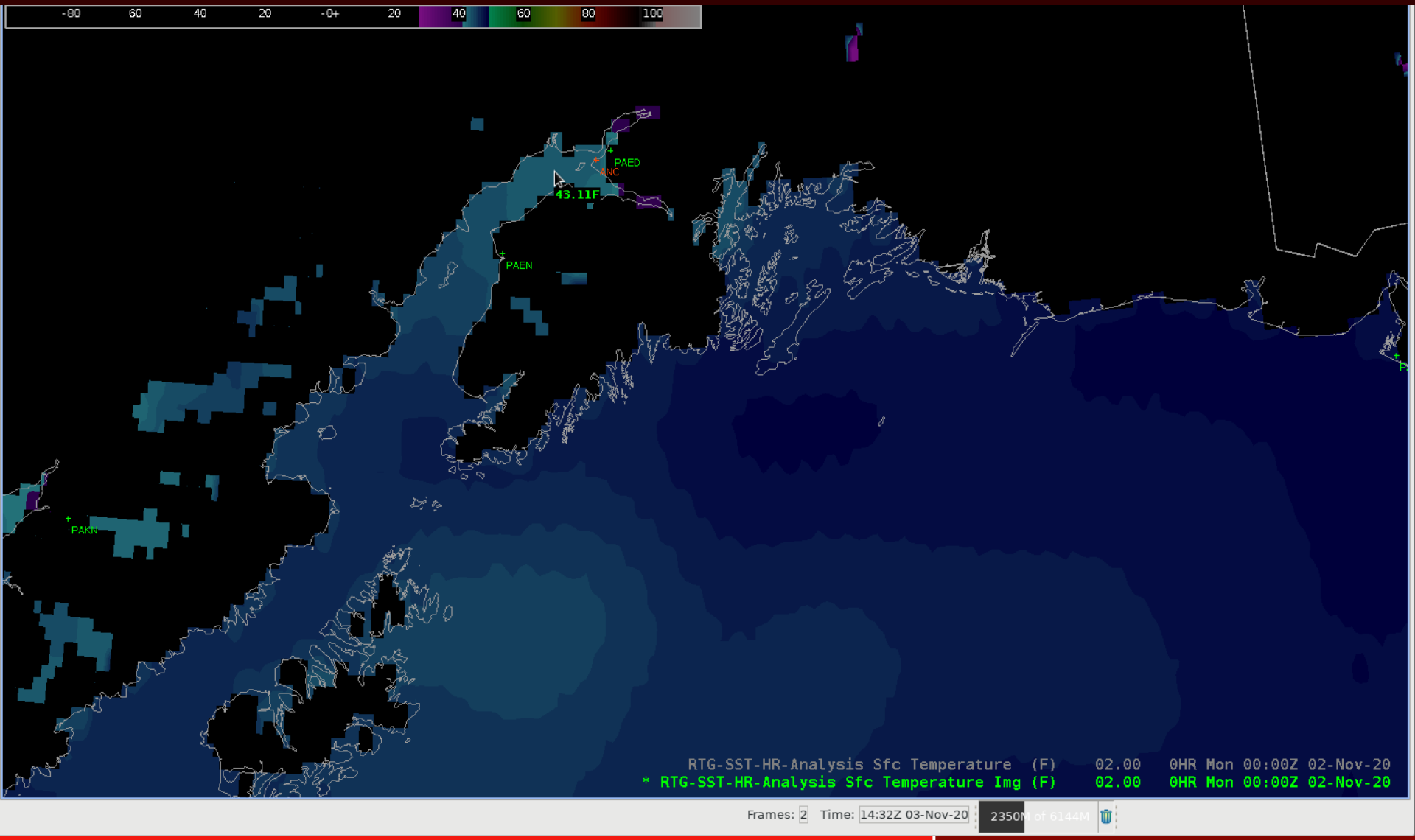
Quick Guide

Why is the Ash RGB Imagery Important?

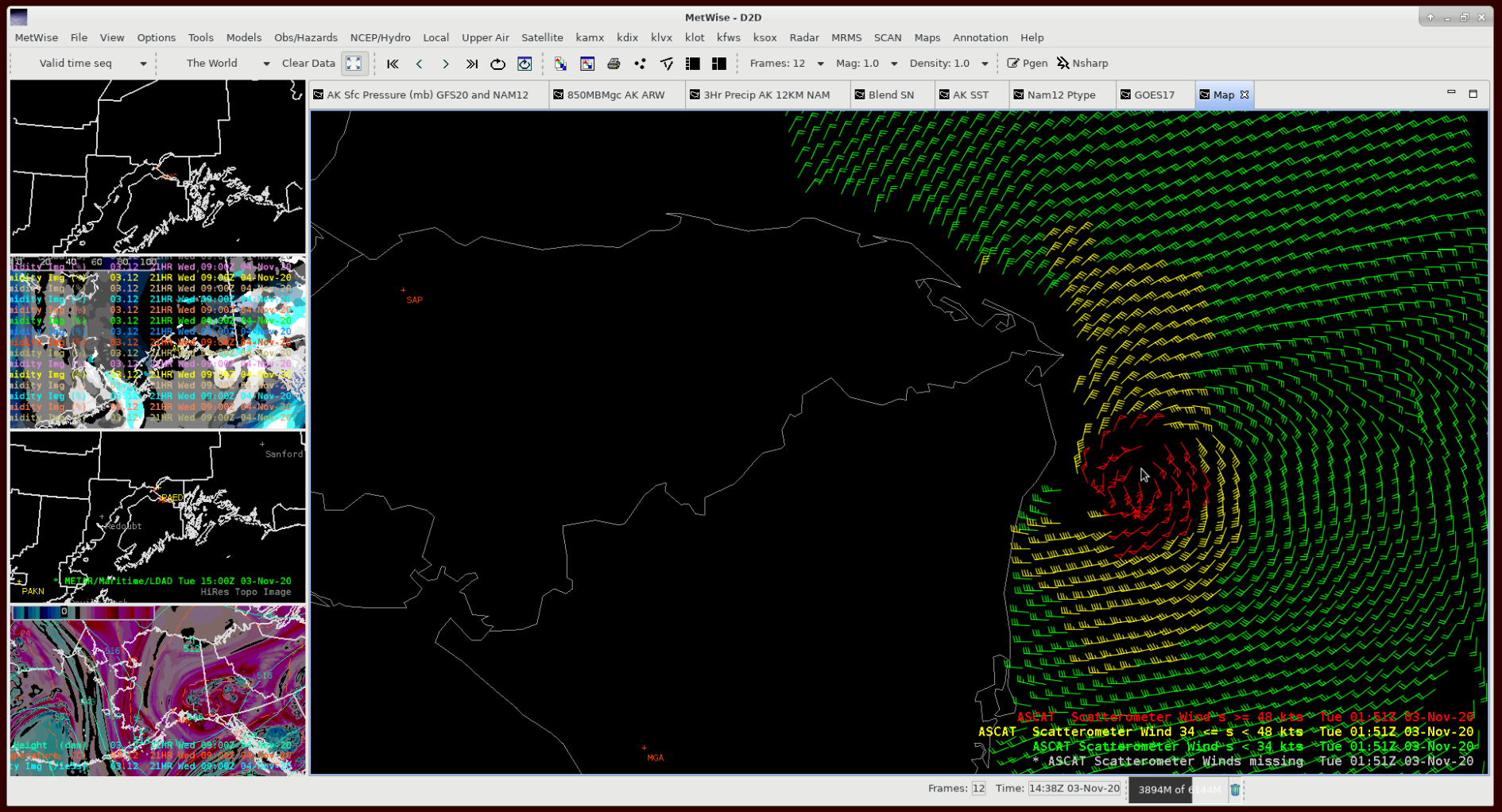
The Ash RGB uses only infrared window channels, and therefore, it can be used both day and night for the detection and monitoring of volcanic ash as well as sulfur dioxide gas. Both of these emissions can be hazardous to public health and aviation activities. The detection of ash plumes is largely due to the opposite absorption characteristics of ash and ice clouds between the 12.3 and 10.3 µm bands (GOES) in the red component of the RGB recipe. A positive difference occurs for ash providing more red than any



Sea Surface Temperatures



ASCAT Scatterometer Data



Current and Future Satellite Needs

- Convection is currently reasonably-well met
  - Global lightning data updated in less than 1 minute
  - Global GOES data, but Europe-India imagery only every 3 hours
- Light Snow events, require aircraft deicing/anti-icing
  - Not reported by automated METAR observations
  - Radar beam only sees 25-50nm from radar due to low altitude.
  - Low clouds with cloud tops -10C or colder
- Light Freezing Drizzle events, require aircraft deicing/anti-icing
  - Not reported by automated METAR observations
  - Radar beam only sees 25-50nm from radar due to low altitude.
  - Low clouds with cloud tops -8C or warmer

Current and Future Satellite Needs

- Depth of Fog layer
  - 200ft vs. 1000ft depth affects estimated surface visibility improvement time
- Cloud Bases between 12,000 and 25,000 feet
  - Not reported by METAR observations
  - Affects Frost/Frozen Dew formation
  - Affects Fog formation/dissipation
- Volcanic Ash density
  - 0.2 mg/m^3
  - 2 mg/m^3
  - 5 mg/m^3
  - 10 mg/m^3

Questions?