

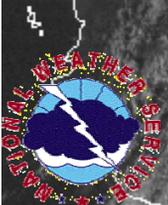
GOES IMAGERY APPLICATIONS at the AVIATION WEATHER CENTER

Steверino Silberberg

NOAA/NWS/NCEP/Aviation Weather Center

Kansas City, MO

January 24, 2008

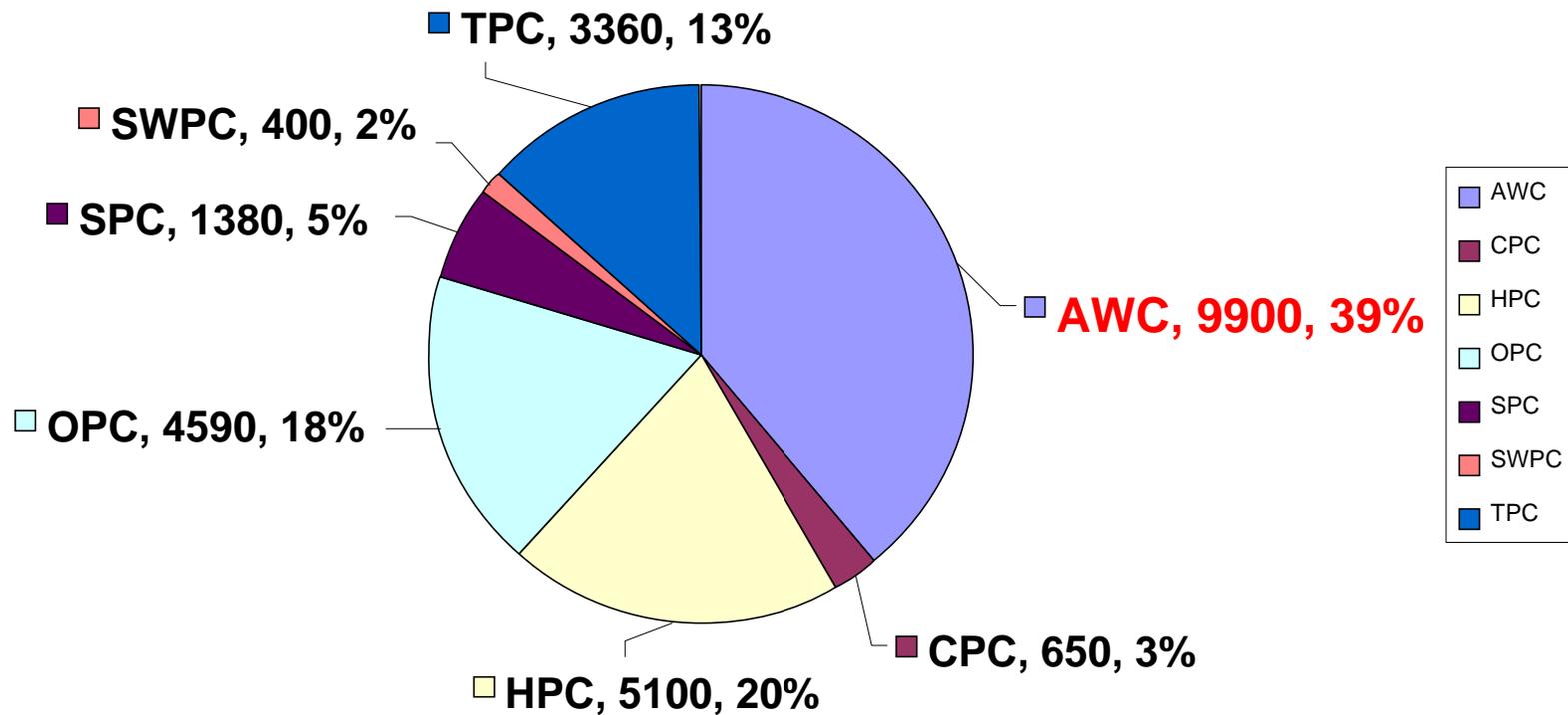




AWC Products

Serve the Nation and the World

Monthly number of forecaster issued products by NCEP Service Centers
MONTHLY Total = 25,380





AWC's Aviation Weather Phenomena

- Clouds/Ceiling (1000, 3000 ft AGL)
- Visibility (3, 5 st mi)
- Mountain obscuration
- Turbulence/Mountain wave
- Low-level wind ≥ 30 kt
- Low-level vector wind shear in lowest 2000 ft AGL
- Icing
- Freezing level height
- Multiple freezing levels (inversions $> 0^{\circ}\text{C}$)
- Convection (prob, coverage)
- Jet streams
- Tropopause height
- Precipitation, type, coverage





AWC Domestic Products

- Area Forecasts (FA) non-IFR clouds, cig/vis, precip/type, wind (SFC – 450), 3/day
- AIRMETS Sierra, Tango, Zulu (SFC – 450), 4/day
- SIGMETS: vis, icing, turb, volc ash (SFC – 450)
- Convective SIGMETS: hourly
- Low-Level Graphic: C&V, turb, frzg level (SFC – 240) 4/day
- CCFP: 2,4,6 h fcst, 10/day, Mar-Oct
- Short term 0→24 h

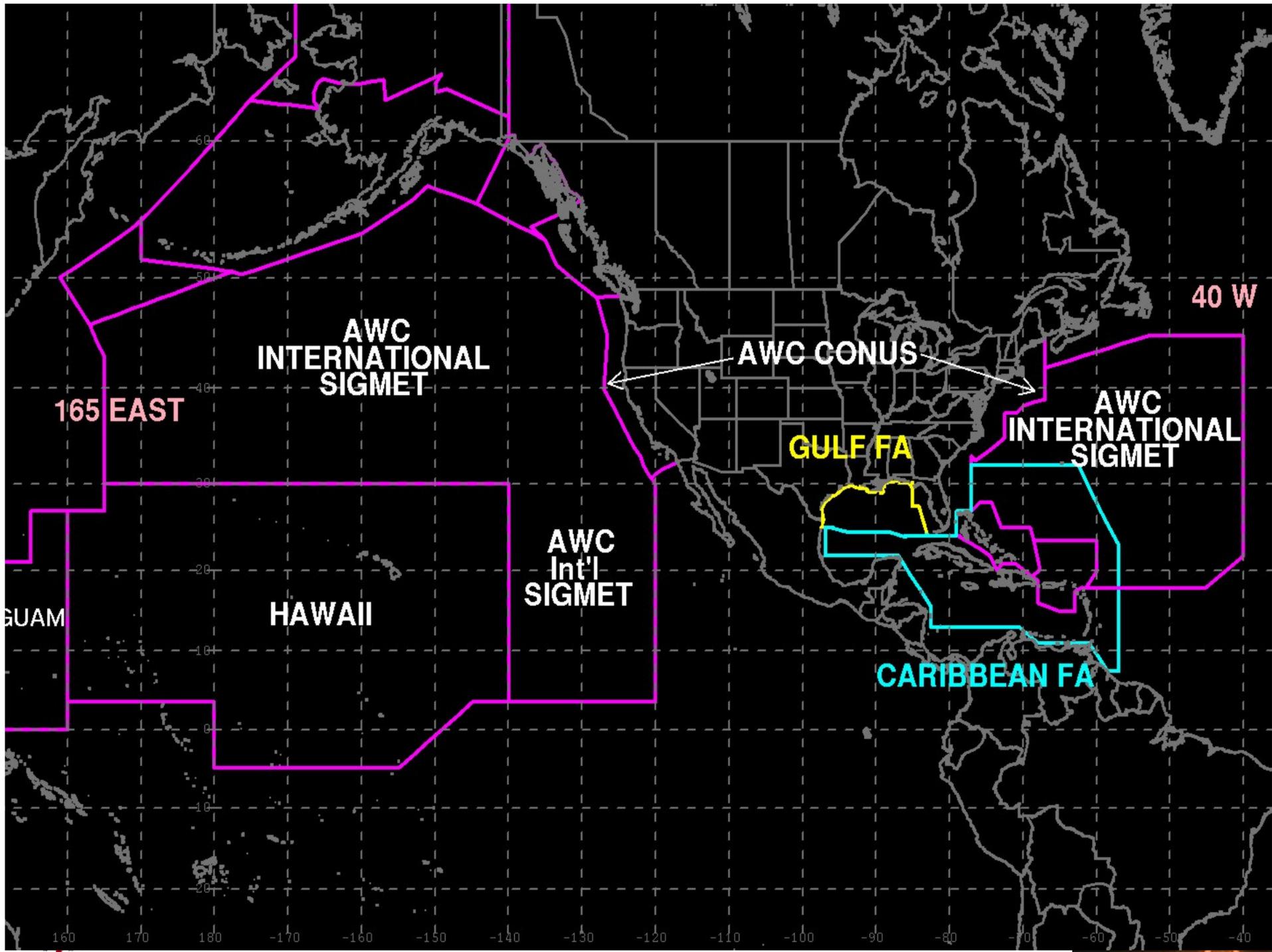




AWC International Products

- Gulf of Mexico Area Forecast: non-IFR clouds, cig/vis, precip/type, wind (SFC – 450), 3/day
 - Oil Rigs: 30,000 people, 600 helicopters, 3500 flights/day, 10,000 passengers/day
- Caribbean Area Forecast: non-IFR clouds, cig/vis, precip/type, wind (SFC – 240), 4/day
- Int'l SIGMETs: cb, turb, VA, icg (SFC – 450)
- Global High-Level SigWx: jets, turb, cb, trop, volcanoes, radioactivity (250 – 630), 4/day
- N. Atlantic Mid-Level Graphic: jets, turb, cb, trop, icing, volcanoes, radioactivity (100 – 450), 4/day
- Short term 0→24 h







AWC Satellite Data

- AWC McIDAS
 - ingests GOES E-W (AWC ground station)
 - ingests Meteosat, MTSAT, POES, GINI from NESDIS McIDAS & AWIPS
 - Vis, IR (12, 11, 3.9 μm), WV
- Fred Mosher's McIDAS macros
 - Low cloud detection over snow during daytime
 - VIS/FOG
 - Global Mosaics (vis/fog, IR, WV, GCD)





AWC Satellite Data

- NESDIS

- GOES Sounder Derived Products
- Volcanic Ash
- Smoke
- Precipitation estimates & Risk
- Precipitable water
- QuikSCAT

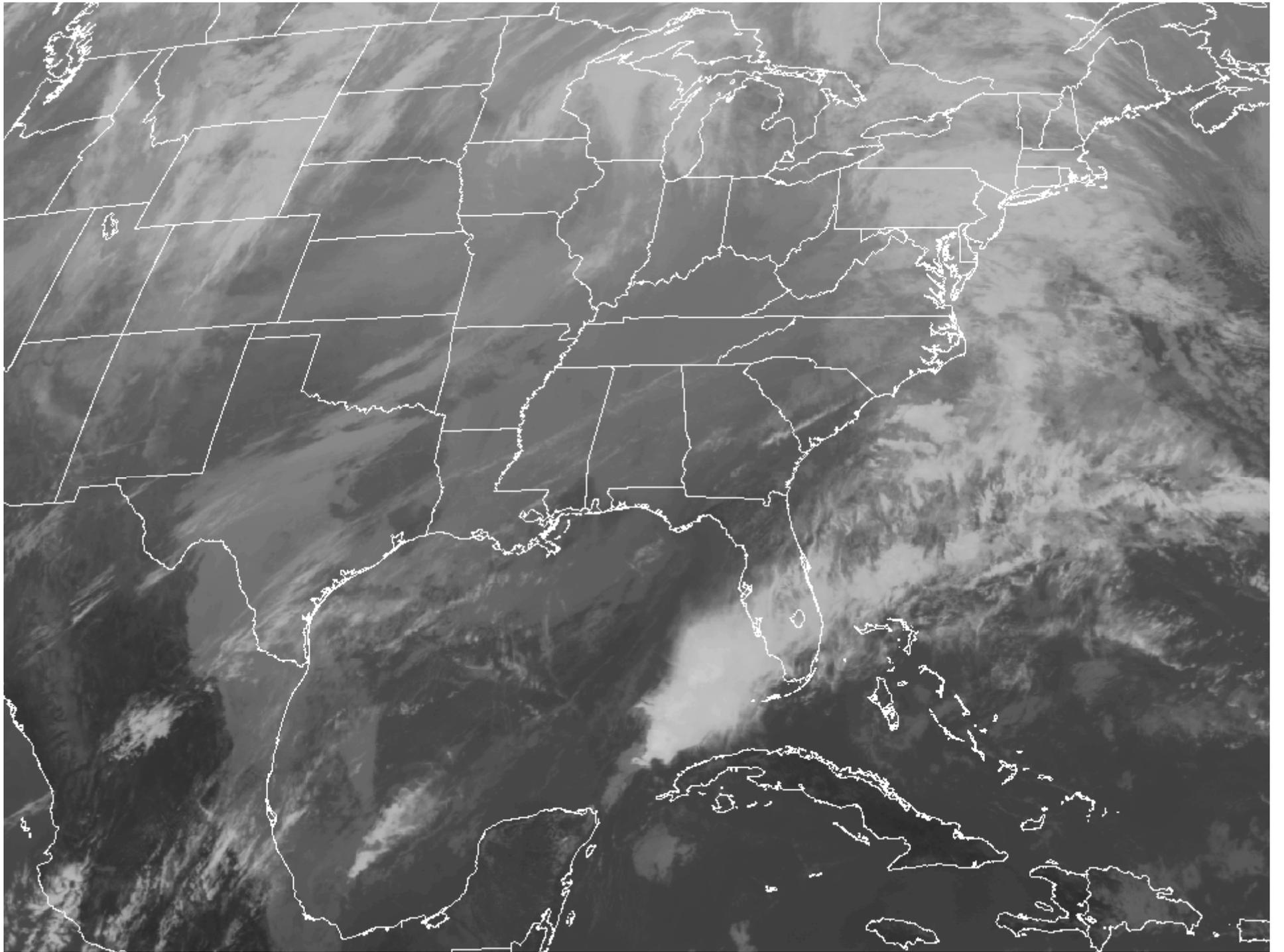


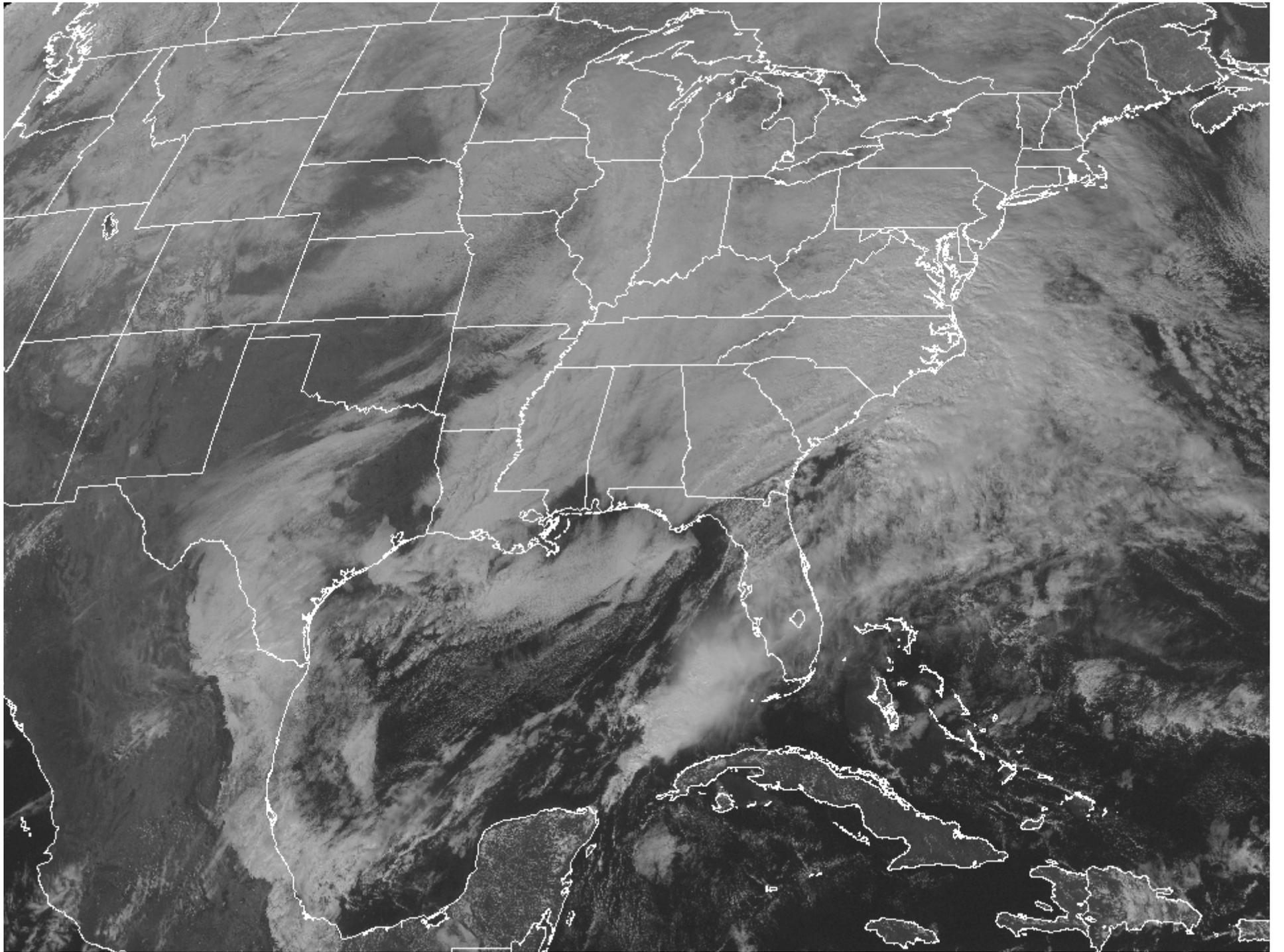


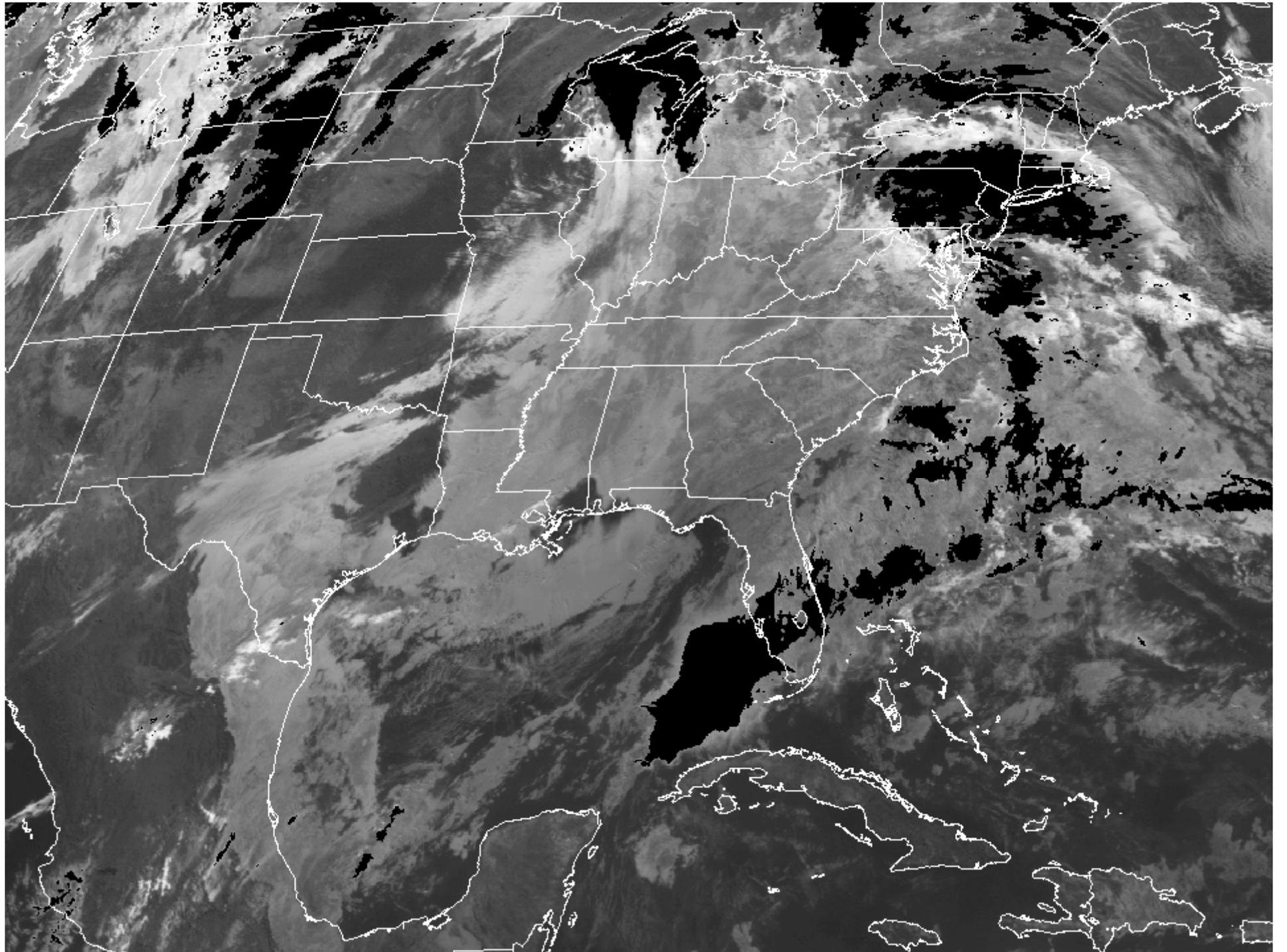
AWC Satellite Imagery

- 24x7x366 METWATCH
 - current weather (METARS, PIREPS, LTG)
 - AWC forecasts
 - Cloud feature diagnosis vs PIREPS
 - Forecast production
- Low Cloud Detection
 - Day: $T(11-3.9 \mu\text{m})$
 - 0 – 70 ΔT stretched into 0–255 counts
 - Divided by $\cos(\text{solar zen ang})$









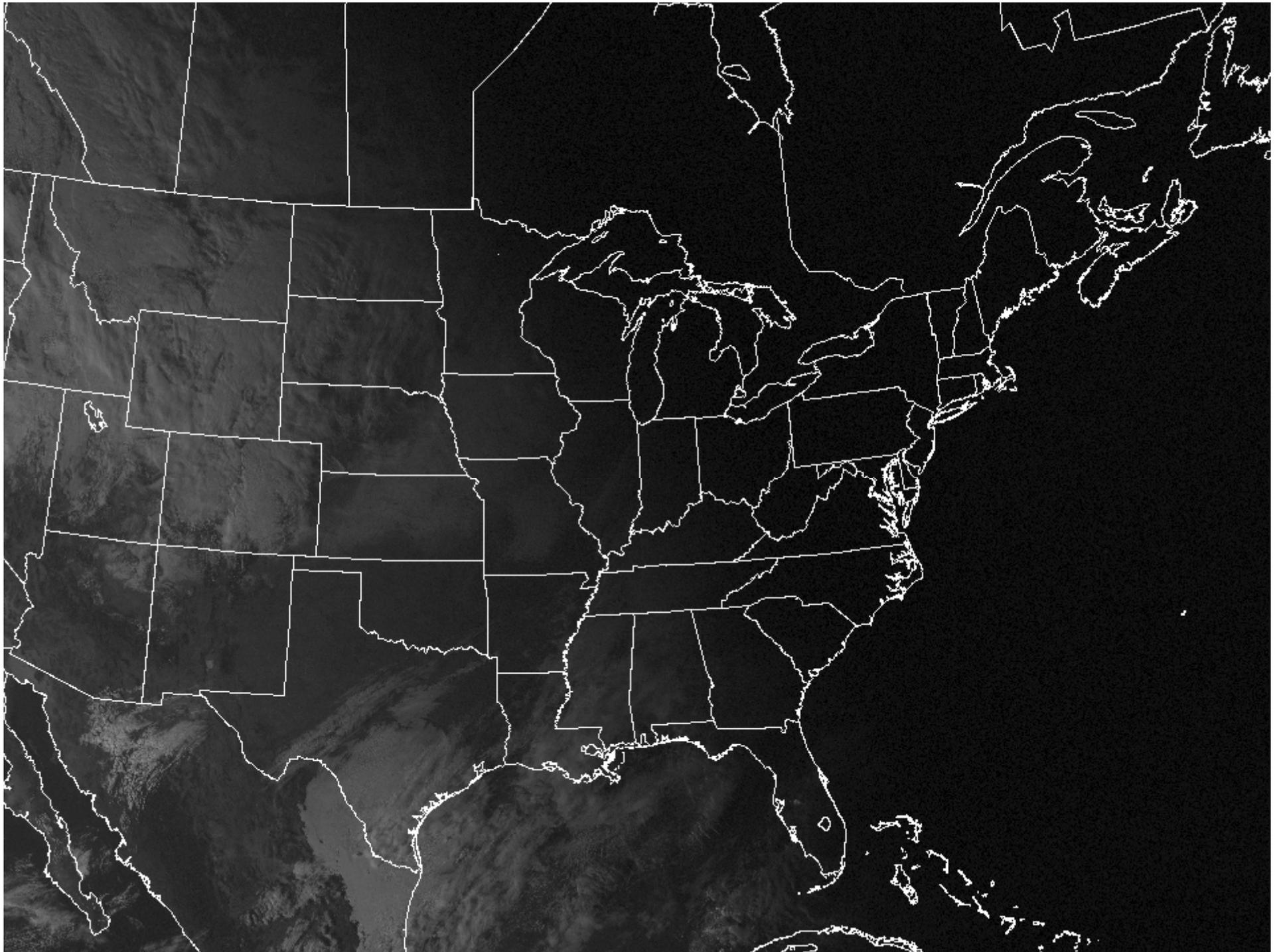


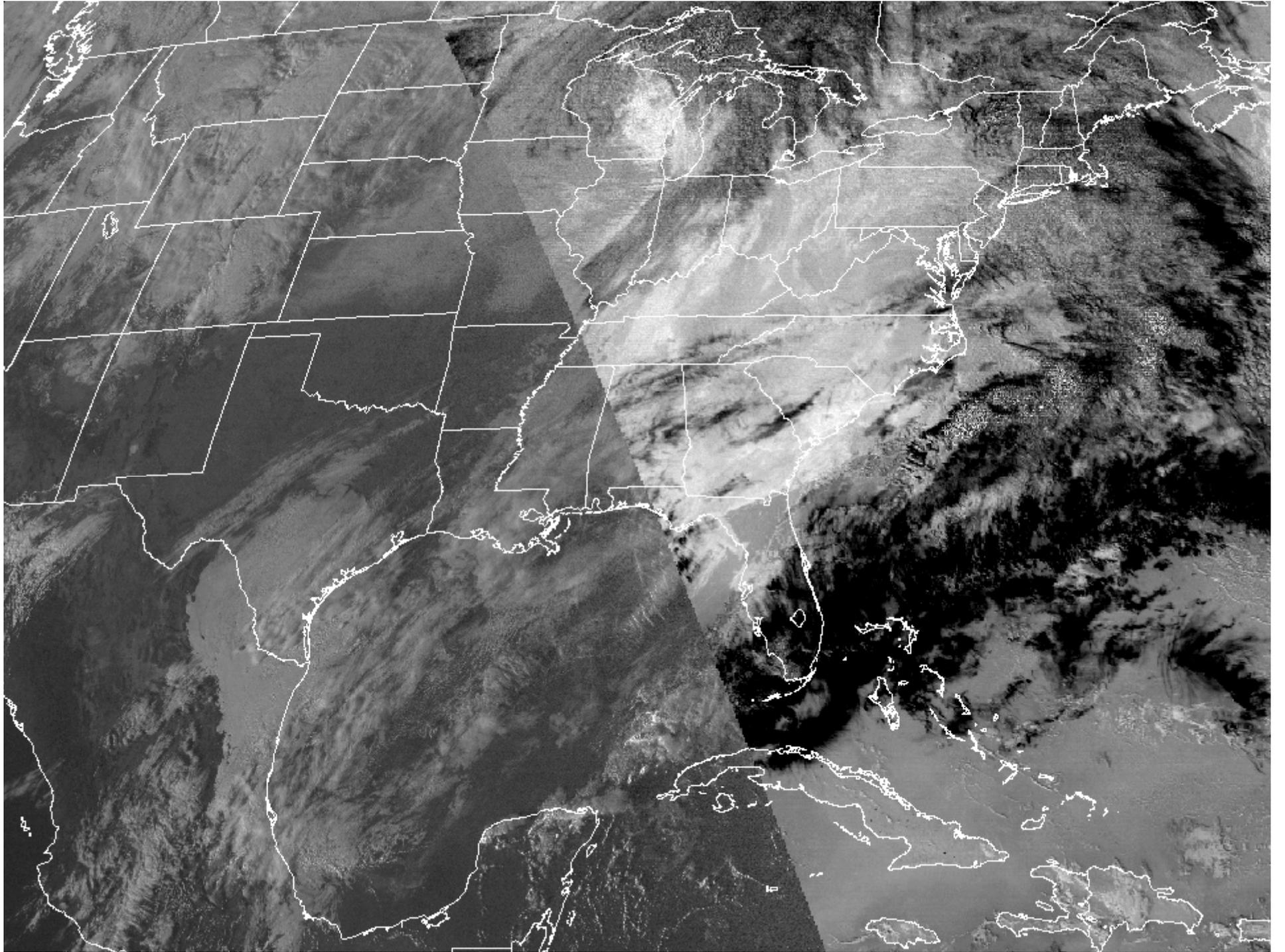
AWC Satellite Imagery

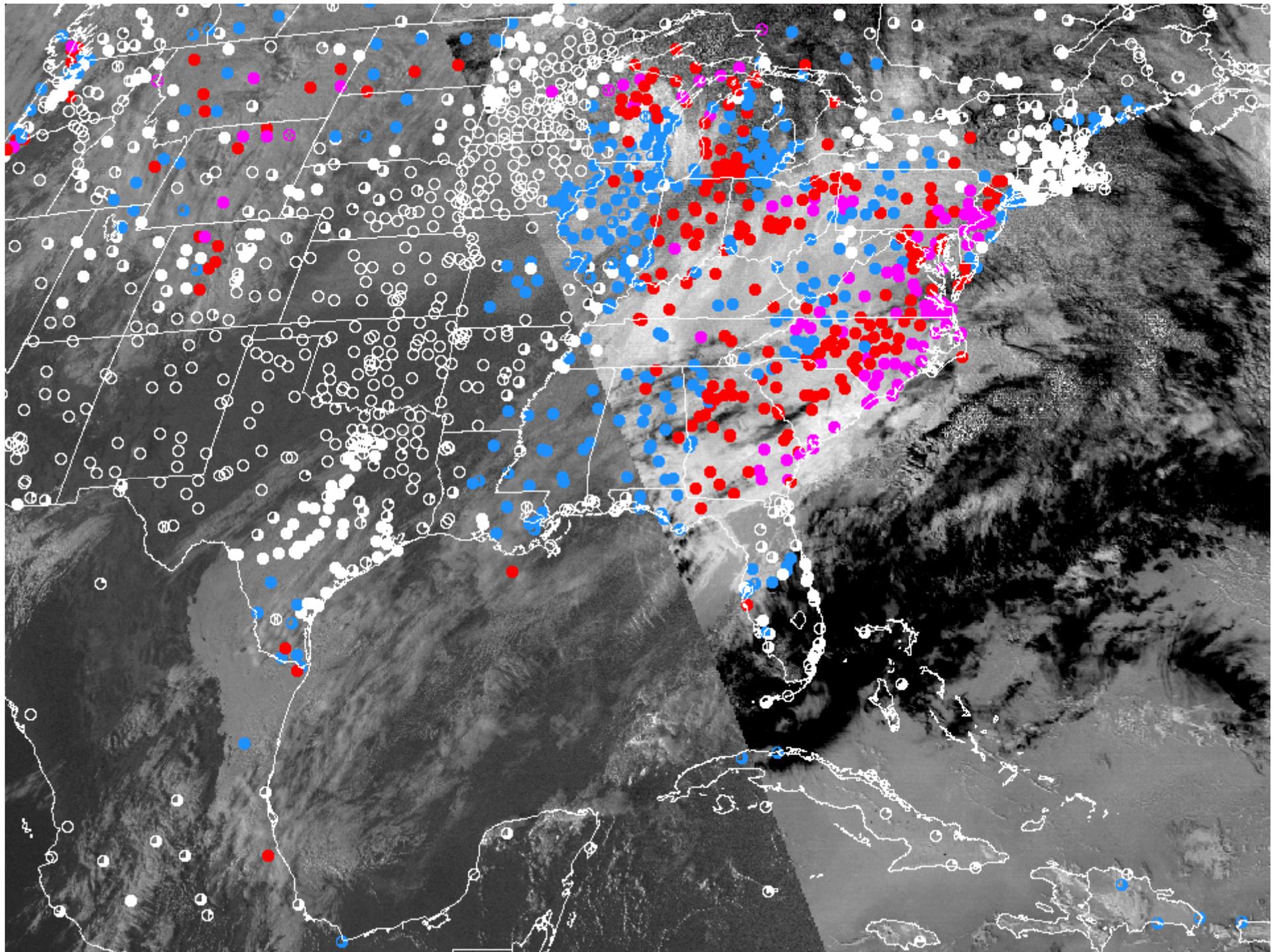
■ VIS/FOG

- VIS brightness normalized $\div \cos(\text{solar zen ang})$
- Night/Fog image when solar zen ang ≤ 3 deg above horizon
- Night/Fog: T(11–3.9 μm)
- -8 to $+6^\circ$ stretched into 0–255 counts







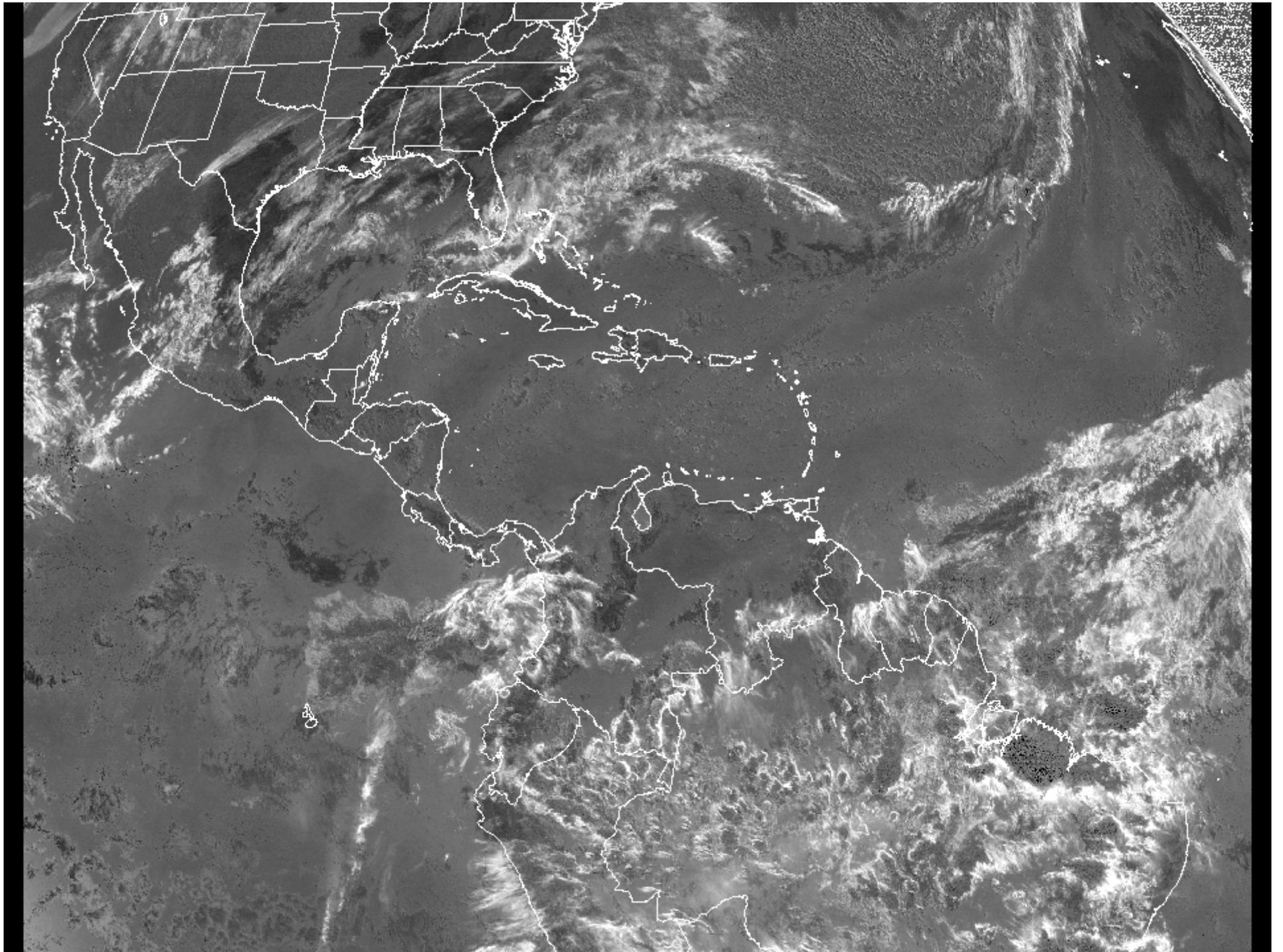




AWC Satellite Imagery

- Volcanic Ash Detection
 - 12–11 μm
 - -8 to $+10^\circ$ stretched into 0–255 counts
 - High dry volcanic ash





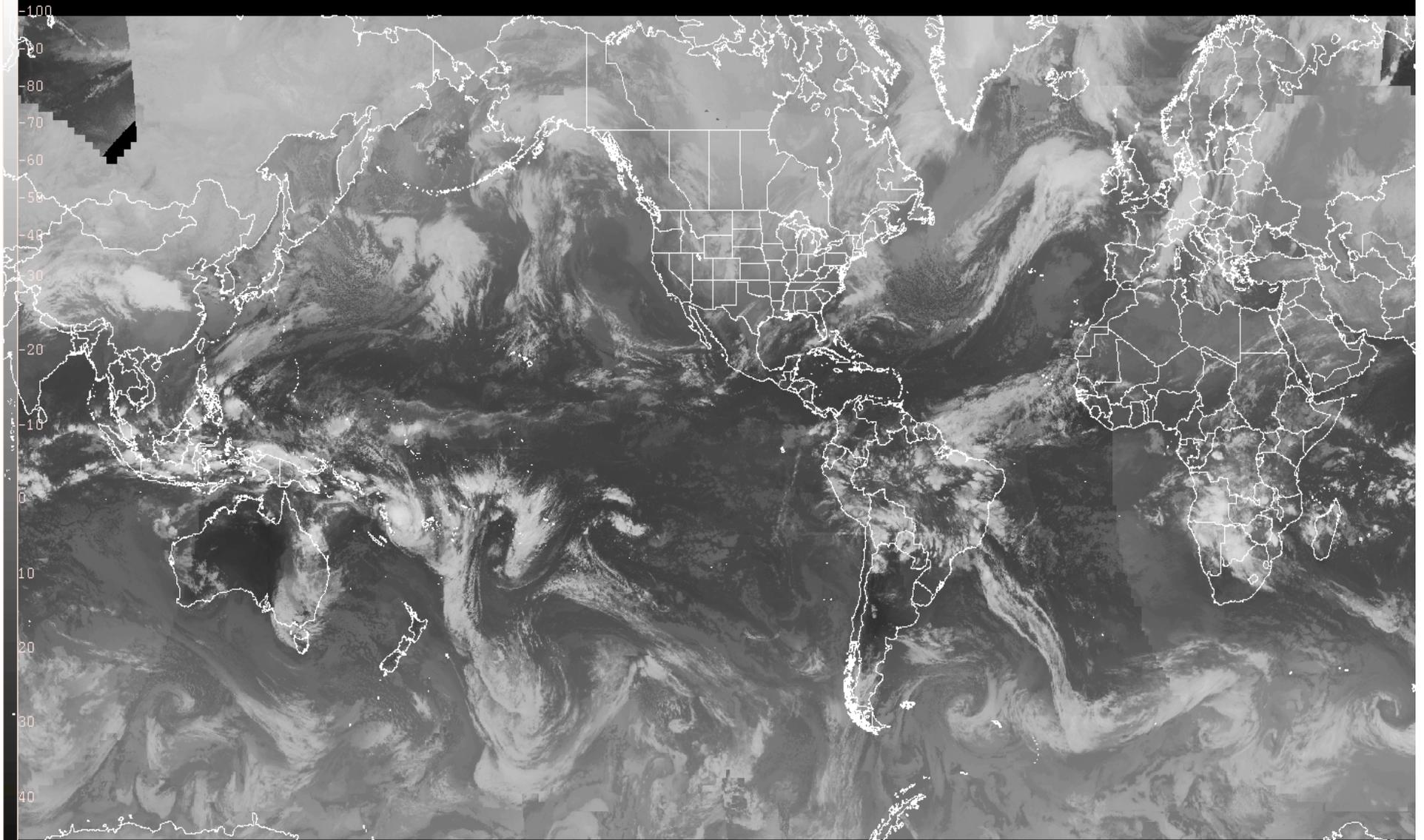


AWC Satellite Imagery

- Global Mosaics

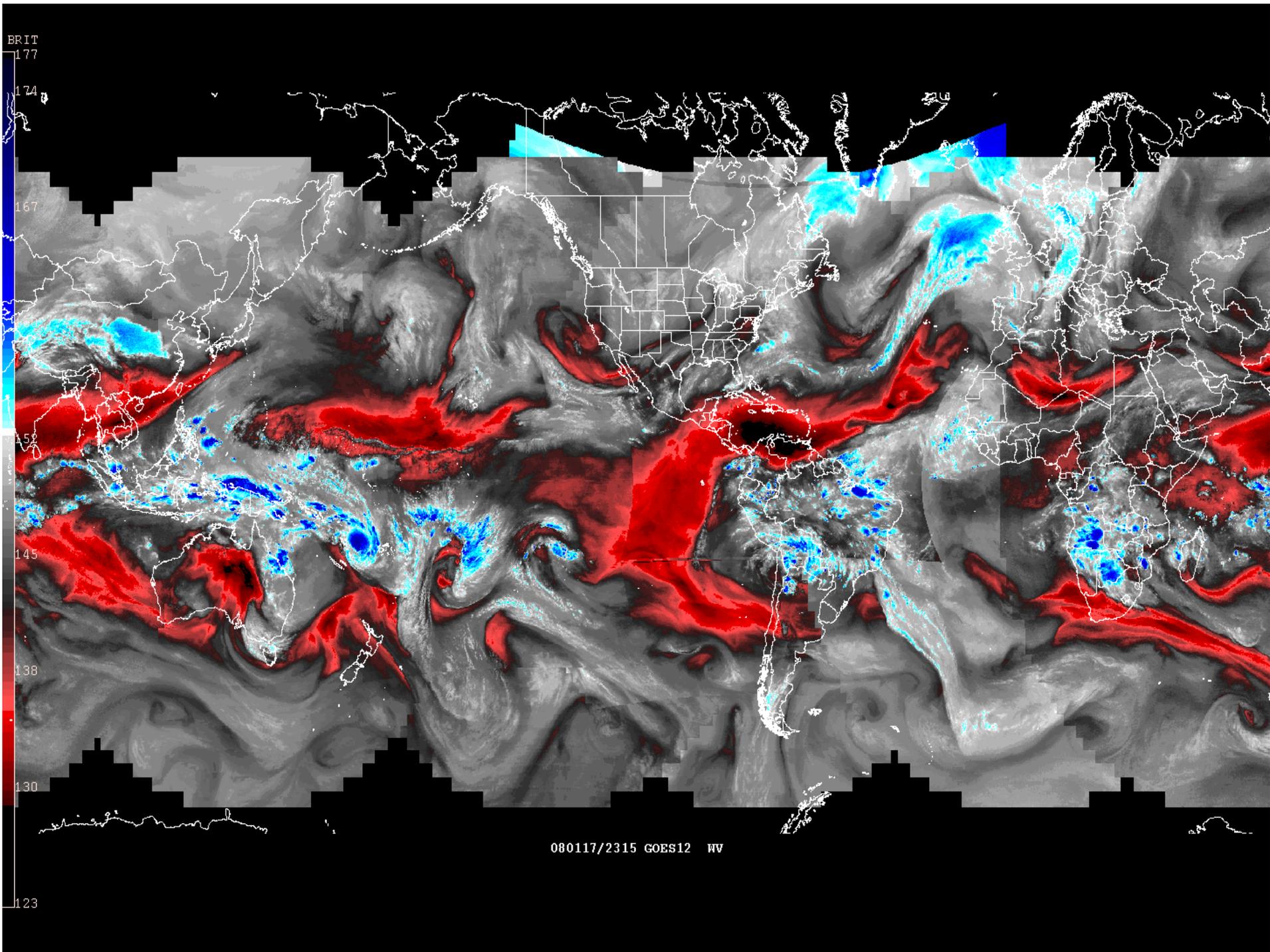


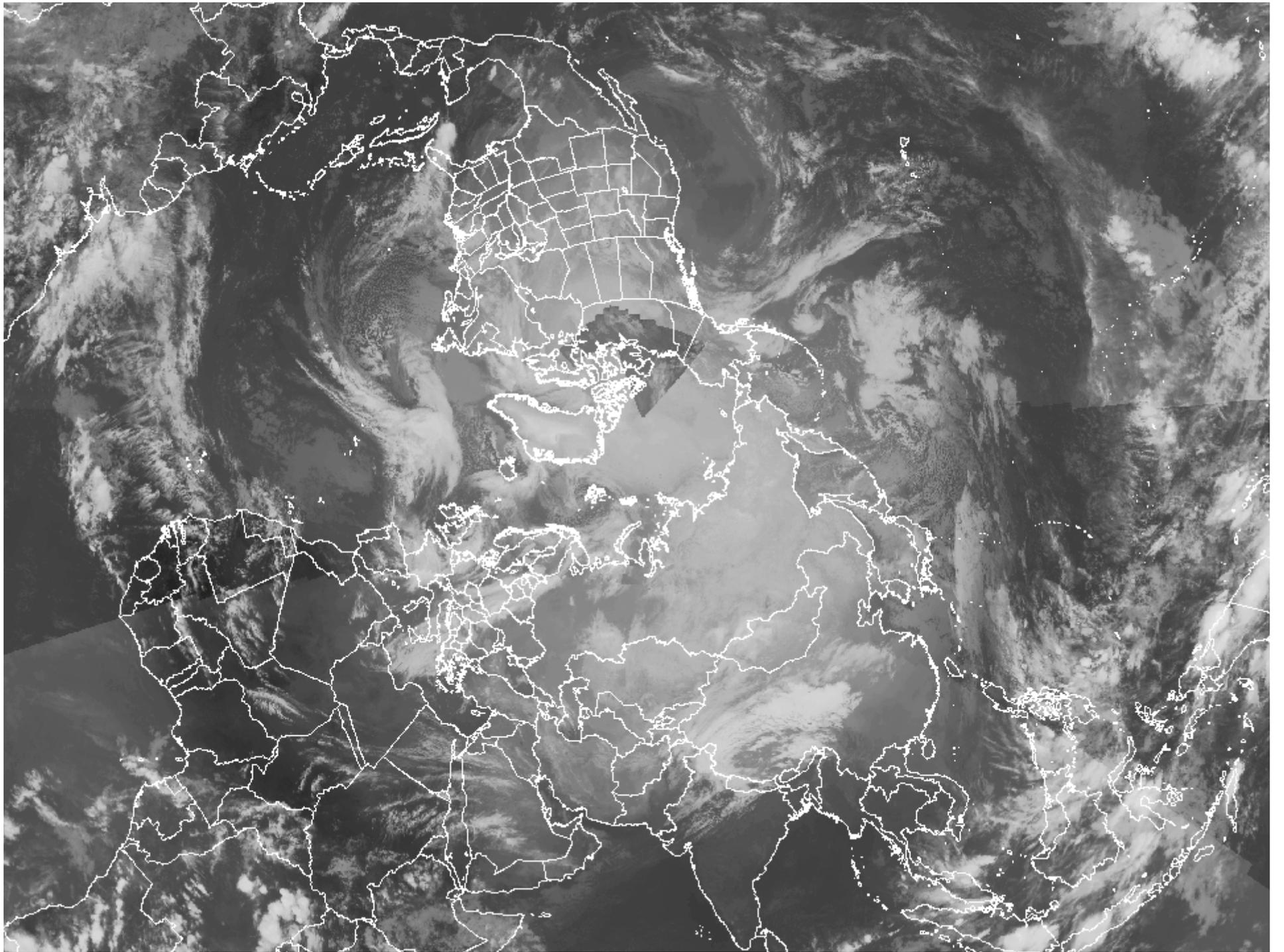
Deg C
-110.1

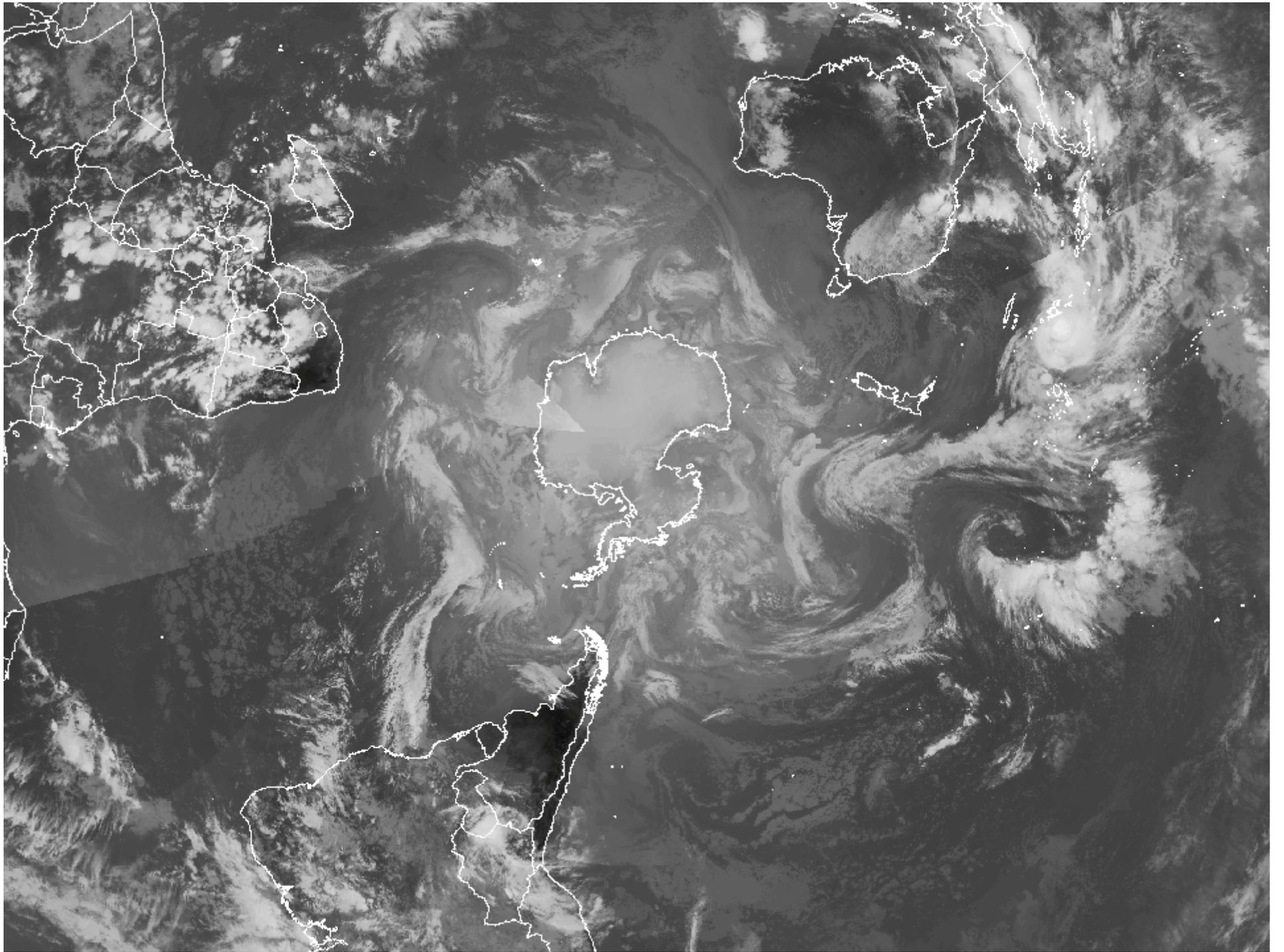


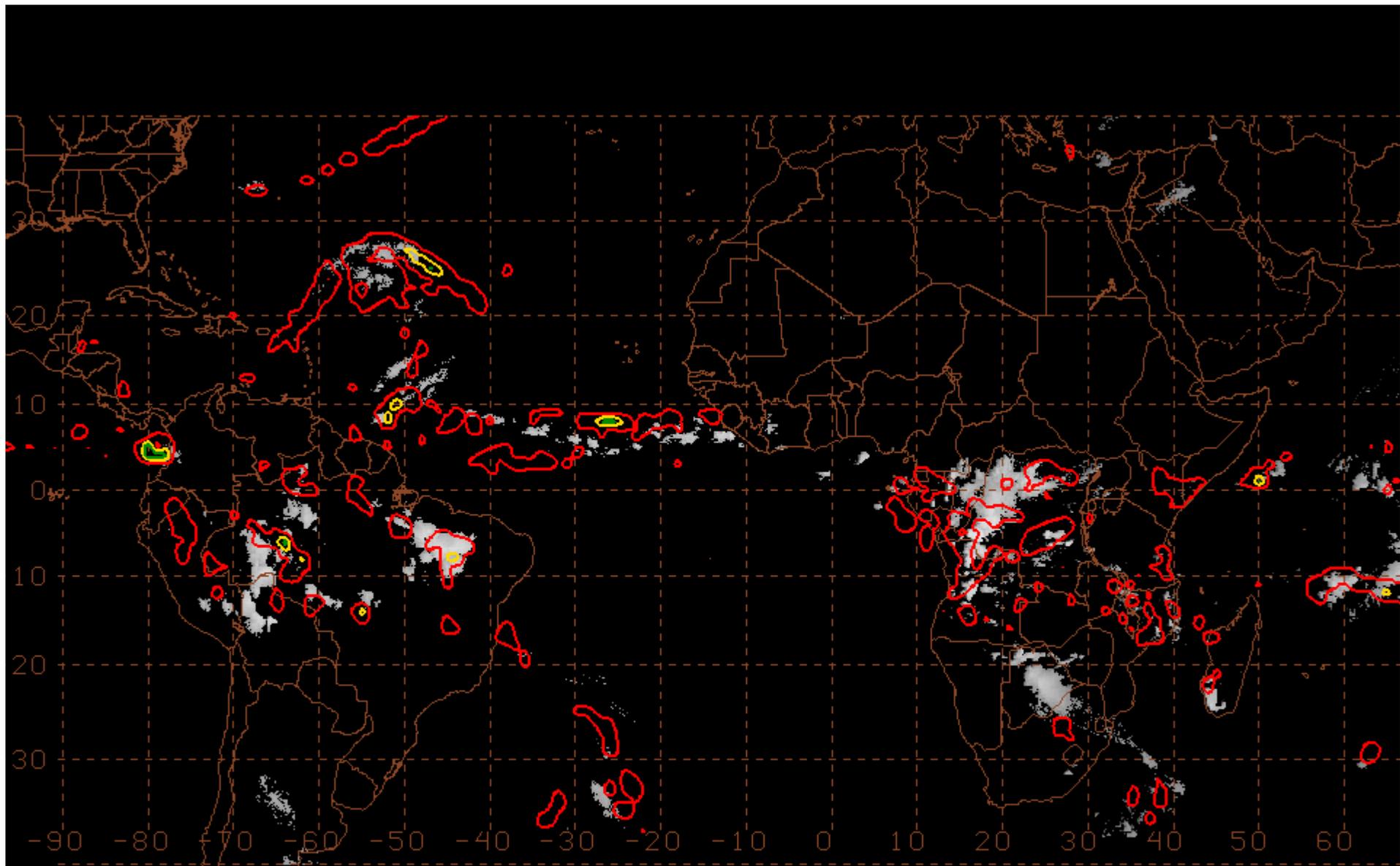
080117/2315 GOES12 IR4

50
56.9



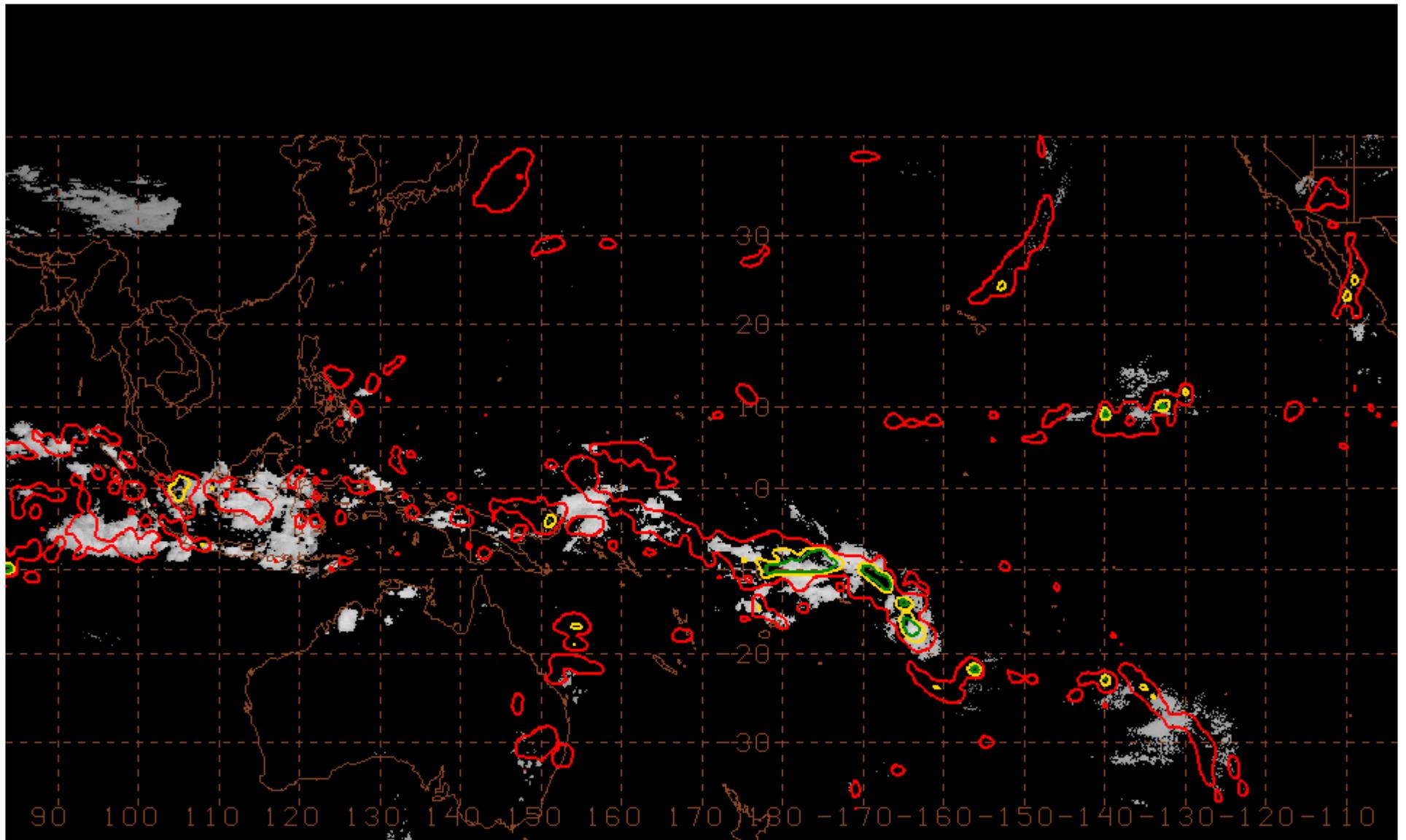






20071201_1145.wr1d-6t14km SAT CB 6 H SUM T(IR-WV)<=1C

071201/1200V024 GFS 6 H ACCUM CONV PCP (3, 13, 20 MM/.12, .51, .79 IN)



20071201_1145.wr1d-6t14km SAT CB 6 H SUM T(IR-WV)<=1C
071201/1200V024 GFS 6 H ACCUM CONV PCP (3, 13, 20 MM/.12, .51, .79 IN)



Summary

- GOES Imagery Critical to AWC Operations
- Fred Mosher's McIDAS Macros → scientific advancement of aviation meteorology and aviation safety
 - Low Cloud Detection
 - VIS/FOG
 - Volcanic Ash
 - Global mosaics
- NESDIS
 - GOES Sounder Derived Products
 - Volcanic Ash
 - Smoke
 - Precipitation estimates & Risk
 - Precipitable water
 - QuikSCAT

