SATCAST Overview
(0-1 hr Convective Nowcasting)

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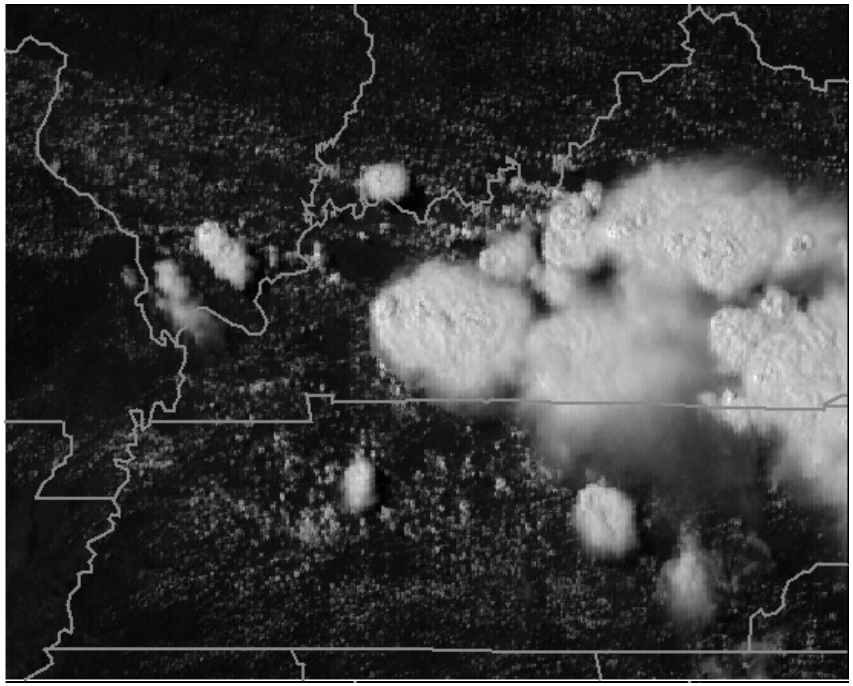
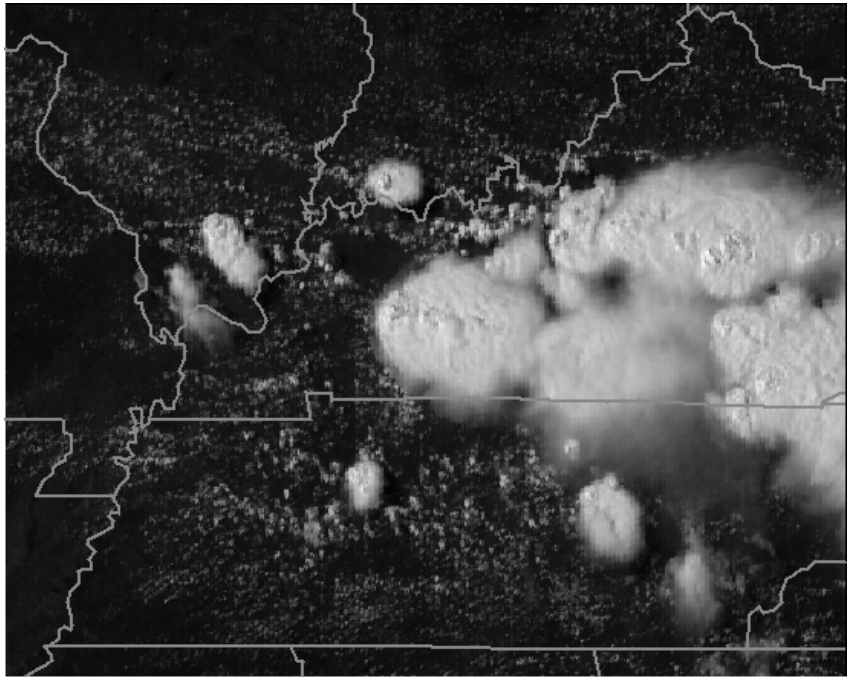
SATCAST Updates

- Updated SATCAST Version 2 has been developed using object based tracking methodology from Zinner et al (2008), Berendes et al. (2008) cloud mask for object identification and SATCAST version 1 interest fields for CI determination.
- Will be evaluated at NOAA SPC HWT Summer 2010, and inclusion within GOES-R Proving Ground and other NOAA WFO's in the summer 2011. Evaluation within CoSPA as a SATCAST upgrade will begin during 2010.
- SATCAST Version 2 has similar output to GOES-R AWG CI algorithm providing output consistency between GOES-I/M and GOES-R.
- SATCAST Version 2 will have real-time validation by easily matching satellite objects and radar in time and space due to the advantage of storm life-cycle monitoring.
- Similar tracking methodology to other nowcasting systems such as RDT and Cb-TRAM.

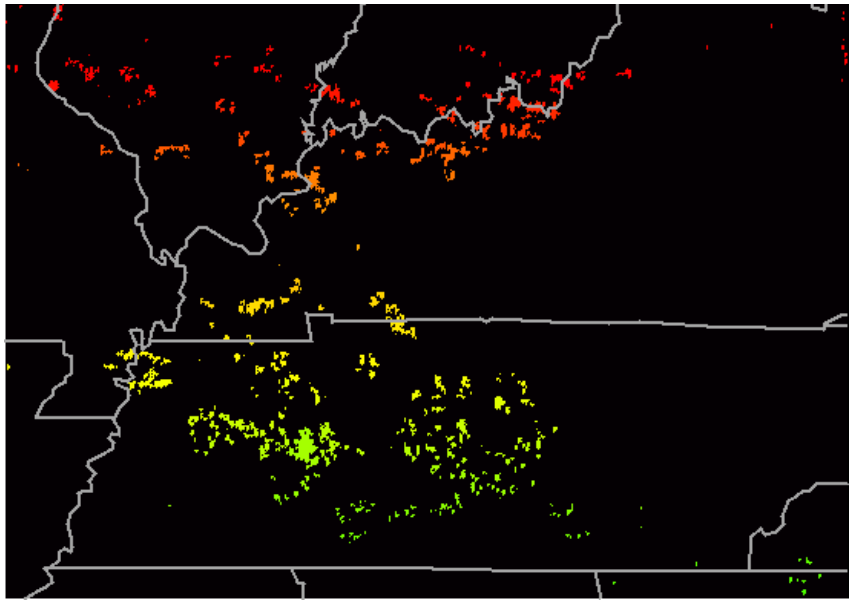
GOES Visible Satellite – Time 1: 2033 UTC



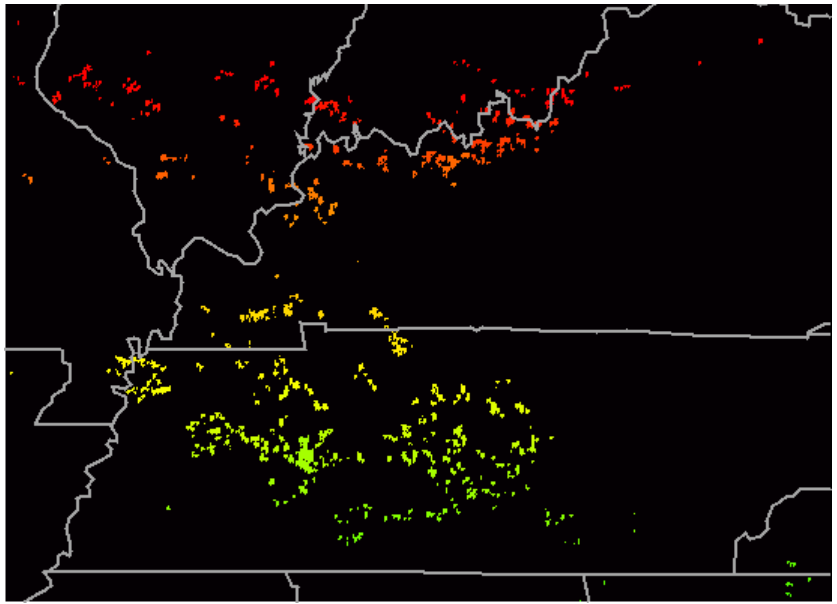
Time 2: 2040 UTC



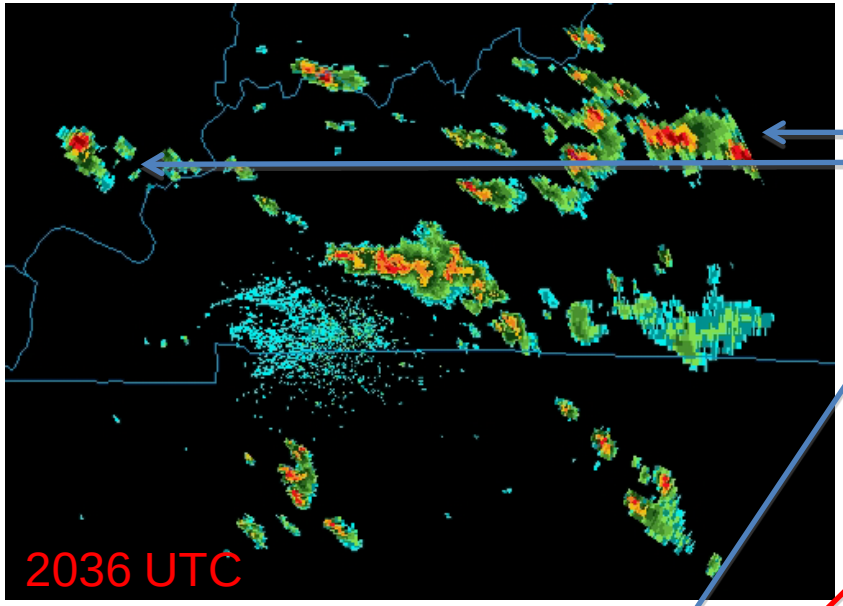
Cumulus Cloud Objects – Time 1: 2033 UTC



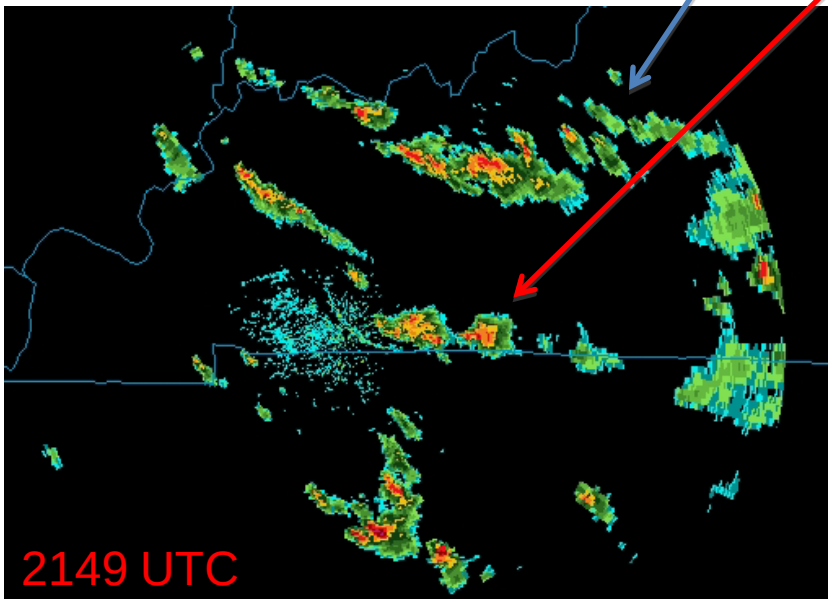
Time 2: 2040 UTC



1 Hr Radar validation: 2036 UTC to 2149 UTC



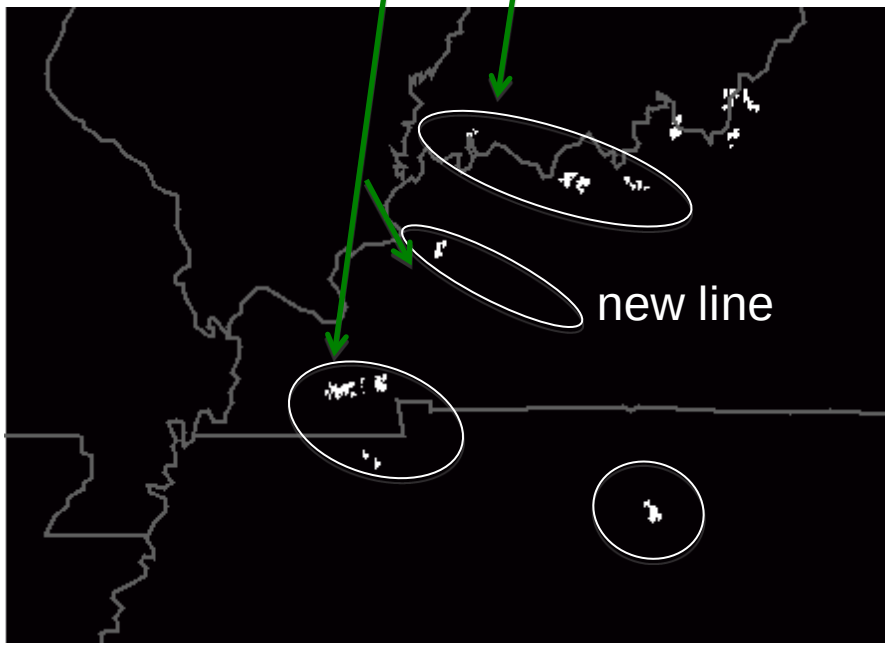
Generally dissipating storms



Missed CI; cirrus anvils may have obscured scene

New CI

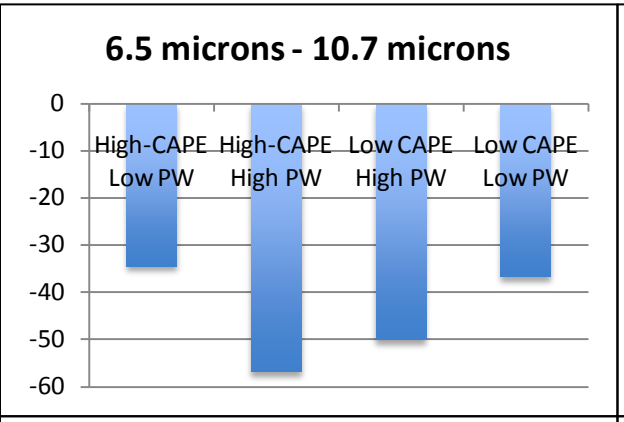
A “training” event

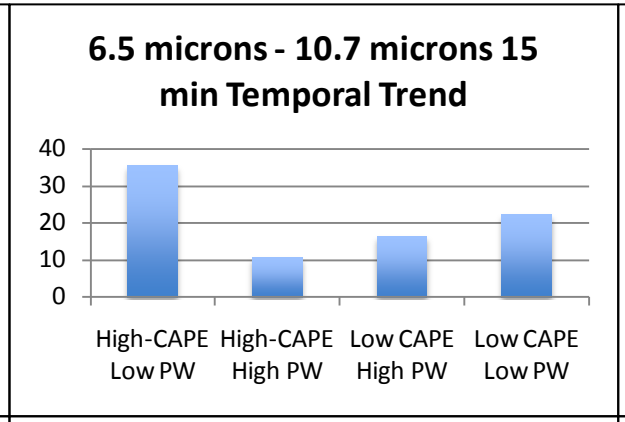


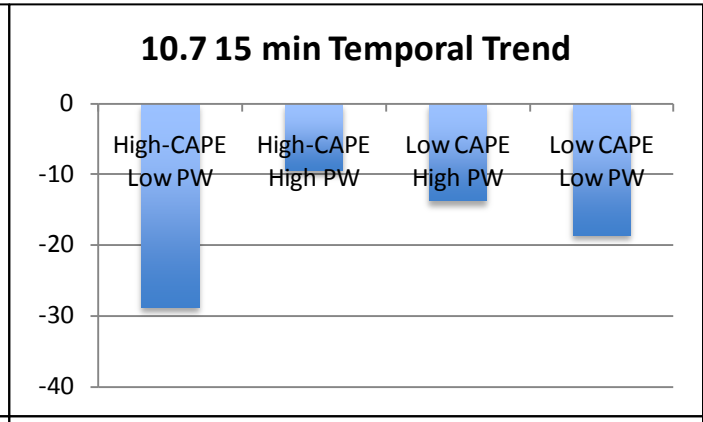
Tracked Features with >5/8 Scores: At 2040 UTC, those convective cloud features that could be tracked were subsequently evaluated spectrally.

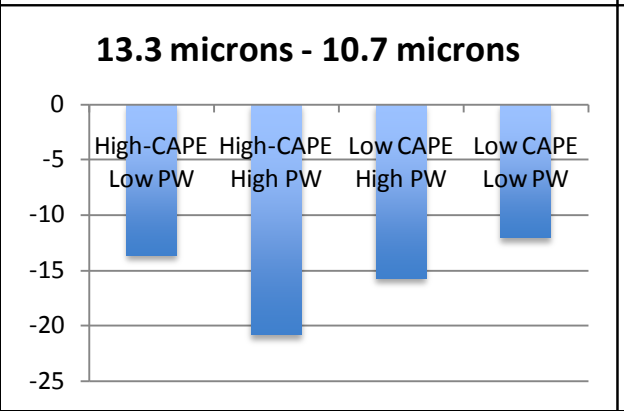
ROSES 2007:
Enhancement to SATCAST Interest Fields

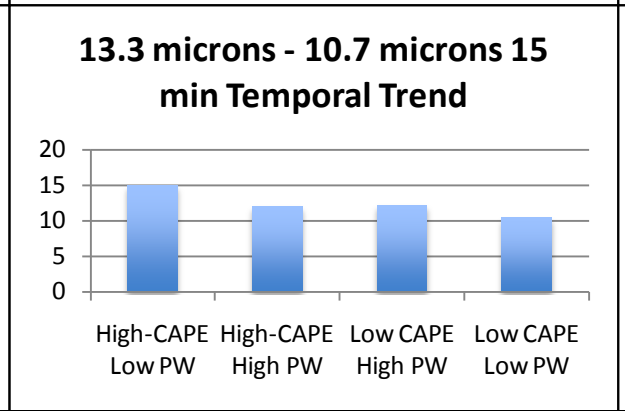
- PW has shown to have most impact on interest fields. Viewing angle is another important impact on the interest fields.
- High amounts of PW can cause some interest fields that use 10.7 µm to miss due to water vapor absorption in that channel.

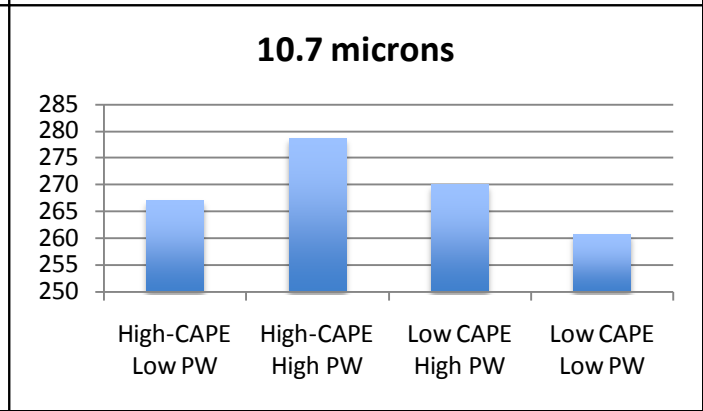












Storm Intensity

- A newly funded project within the NOAA GOES-R Risk Reduction as a feasibility to couple GOES-R ABI and GOES-R GLM.
- Objective: Couple MSG data and TRMM LIS lightning data to develop diagnostic storm intensity for growing, mature and decay storms.
- Means for diagnosing intensity from GOES-R (MSG) and GLM (TRMM LIS):
  - ✓ Rapid expansion rates – anvils, convective cores
  - ✓ Strong updrafts
  - ✓ Frequent lightning/High lighting flash rates
  - ✓ Deep cumulonimbus clouds
  - ✓ Longevity – intense storms last longer
- Couples to NextGen requirements for monitoring growing and mature convective storms at high time and apace resolutions, especially in radar void regions/airspace.

Rank	CI Interest Fields	Mean	Standard Deviation
	Cloud Depth		
1	6.2–10.8 μm	−14.6	11.27
2	6.2–7.3 μm	−6.6	5.94
3	10.8 μm T_B	242.5	16.79
4	7.3–13.4 μm	5.4	4.42
5	6.2–9.7 μm	−8.4	3.40
6	8.7–12.0 μm	0.3	1.92
	Glaciation Indicators		
1	15-min Tri-Spectral	0.7	2.02
2	Tri-Spectral	−0.6	1.94
3	15-min 8.7–10.8 μm	0.5	1.47
4	8.7–10.8 μm	−0.1	1.55
5	15-min 12.0–10.8 μm	0.2	1.05
6	15-min 3.9–10.8 μm	0.3	0.24
7	12.0–10.8 μm	−0.5	1.15
	Updraft Strength		
1	30-min 6.2–7.3 μm	7.2	4.92
2	15-min 10.8 μm T_B	−12.1	9.44
3	30-min 10.8 μm T_B	−20.4	13.54
4	15-min 6.2–7.3 μm	4.3	3.58
5	30-min 9.7–13.4 μm	4.9	4.31
6	30-min 6.2–10.8 μm	14.5	8.78
7	15-min 6.2–12.0 μm	8.0	6.32
8	15-min 7.3–9.7 μm	−3.3	4.02

	Flash rate (fl min^{-1})
CAT-0	0-0
CAT-1	0.7-2.2
CAT-2	2.2-30.9
CAT-3	30.9-122