

NWS WFO Omaha

Proving Ground Product Evaluation Summary

2014 GOES-R/JPSS PG/User Readiness Meeting

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Science and Operations Officer

WFO Omaha (OAX)

Proving Ground History

- 2010:
 - February 2010: CIRA's GeoColor and LC-Fog
 - May 2010: Attended PG All-Hands Meeting, Boulder
 - June 2010: NOAA HWT June 2010 (GOES-R PG emphasis)
 - July 2010: CIMSS CI/**CTC**/OT
- 2011:
 - January: CIRA's SimWRF
 - May 2011: Attended PG Meeting, Boulder
 - June 2011: NOAA HWT June 2010 (GOES-R PG emphasis)
 - July 2011: AWIPS2 installed at OAX
 - November 2011: OAX completes transition to AWIPS2

WFO Omaha (OAX)

Proving Ground History

- 2012:
 - May 2012: UAH **SATCAST** (GOES-R CI)
 - May 2012: Attended GOES-R PG Meeting, KC
 - Dec. 2012 – NPP VIIRS
 - Dec. 2012 – Awarded COMET GOES-R PG COOP with UNL
- 2013:
 - March 2013: NOAA Satellite Science Week (Virtual)
 - August 2013: TOAX installed at WFO OAX
- 2014:
 - April 2014 - **NUCAPS**
 - Almost: CIMSS's **ProbSevere**
 - Senior Forecaster at HWT (GOES-R PG)

*Emphasis on
Convection-Oriented
Analysis*



WFO OAX GOES-R/JPSS Training Experiences

- “Train the Trainer” method **from** GOES-R PG workshops, HWT experiences, and conferences **to** forecasters
 - Annual Severe Weather Seminars at WFO OAX
 - Annual Winter Weather Seminars at WFO OAX
 - Incorporated into WFO OAX Seasonal “Training Matrices” (Required training lists)
 - One on one with live data on AWIPS(2) workstations



- Webinars (**Recorded** is very important at WFOs)
- Articulate “video” training modules

CIRA Blended TPW and Anomaly Training by NASA SPoRT (00:57 / 30:23) ATTACHMENTS

SPORT

Kevin Fuell
Research Scientist -
University of Alabama
Huntsville / NASA/SPoRT

Outline Thumbnails Notes Search

1. Intro - CIRA Blended TPW & Anomaly
2. Module Objectives:
3. How much do you know about TPW?
4. TPW - 3 questions
- ▶ 5. TPW - Oh, let me count the ways!
- ▶ 14. Blended TPW Anomaly
21. Monitor Trends and Moisture Plumes
22. Validate Model Initialization
23. Increase Lead Time for Flooding Events
24. Tracking Tropical Waves
25. Interaction of Tropical and Mid-Latitude
26. Conclusions
27. Future Work (2009/2010)
28. References & Resources

CIRA Blended TPW and Anomaly
with NASA SPoRT and NOAA NESDIS

Products Developed by Cooperative Institute for Research in the Atmosphere (CIRA)

- Training module creation & product transition and evaluation by NASA SPoRT and its NOAA partners
- Short-term Prediction Research and Transition (SPoRT)
- Value in areas of: **flooding, severe weather, model validation, tropical waves, low level moisture flow**

Training by: Kevin Fuell - NASA SPoRT / UAH
Geoffrey Slano - NASA SPoRT / ENSCO

Contributors: John Forsythe
Sheldon Kusselson
Pablo Santos

CIRA
- NOAA/NESDIS/SAB
- NWS Miami

articulate
POWERED PRESENTATION

SLIDE 1 OF 28 PAUSED 00:57 / 01:58

NOAA/CIMSS ProbSevere Model Training and Supplemental Material

This page provides recorded training in Powerpoint Articulate format as well as supplemental material for those interested in further details about the NOAA/CIMSS ProbSevere model.

NOAA/CIMSS ProbSevere Model

– Training Module –
Spring 2014

[Click for Powerpoint Articulate Training Module](#)

Supplemental Table of Contents

- Statistical Model Details
- RAP Data and Temporal/Spatial Compositing
- Satellite Data and Products
- Radar Data and Products
- Model Performance

Additional Links

Weather and Forecasting paper (2014)
Cintineo et al. 2014 AMS Annual Meeting Oral Presentation
[Spring 2014 Training Powerpoint](#)

**Showcase
Training Material**

This was a game-changer for WFO OAX Forecasters

articulate®

Outline Thumbnails Notes Search

- 51. South Carolina Example
- 52. South Carolina Example
- 53. South Carolina Example
- 54. South Carolina Example
- 55. Iowa Example
- 56. Iowa Example
- 57. Iowa Example
- 58. Iowa Example
- 59. Iowa Example
- 60. Iowa Example
- 61. Iowa Example
- 62. Iowa Example
- 63. Iowa Example
- 64. What information does the satellite provide**
- 65. Nebraska Examples
- 66. Nebraska Examples
- 67. Nebraska Examples
- 68. Nebraska Examples
- 69. Nebraska Examples
- 70. Nebraska Examples
- 71. Nebraska Examples
- 72. Nebraska Examples
- 73. Nebraska Examples
- 74. Nebraska Examples
- 75. Oklahoma Example
- 76. Oklahoma Example

What information does the satellite provide?

2059 UTC Jun-18-2013

IA

MO

IL

Prob = 93%

NWP + Satellite + Radar

IA

MO

IL

Prob = 40%

NWP + Satellite + Radar

Time (UTC)	With Satellite	Without Satellite
1954	6%	3%
1959	18%	3%
2009	35%	7%
2014	60%	12%
2054	73%	18%
2059	93%	40%

←

National Oceanic & Atmospheric Administration

Cooperative Institute for Meteorological Satellite Studies
University of Wisconsin - Madison

Cooperative Institute for Research in the Atmosphere
Colorado State University

WFO OAX GOES-R/JPSS Training Experiences

- Sharing of **Blog** entries

Blogs

- [CIMSS Satellite Blog](#)
- [CIRA/RAMMB GOES-R Proving Ground Blog](#)
- [GOES-R Fog Product Examples Blog](#)
- [GOES-R/JPSS Satellite Liaison Blog](#)
- [GOES-R Proving Ground at the Aviation Weather Testbed Blog](#)
- [GOES-R Proving Ground at NOAA's Hazardous Weather Testbed Blog](#)
- [GOES-R Tropical Pacific Proving Ground Blog](#)
- [It's Severe: GOES-R/JPSS Proving Ground Blog](#)
- [The Wide World of SPoRT Blog](#)

Real-Time Product Examples

- [GOES-14 Imager 1-min imagery \(SRSOR\)](#)
- [GOES Convective Storm Monitoring and Nowcasting Products](#)
- [GEOstationary Cloud Algorithm Test-bed \(GEOCAT\)](#)
- [MODIS Today](#)

cimss.ssec.wisc.edu/goes/blog/archives/category/cloud-top-cooling

GOES-R blog

Most Visited Getting Started Latest Headlines NWS Omaha/Valley In... CU BlueLine DailyBulletin Springview WX NAM/GFS/WRF Imagery

GOES-15 (left) and GOES-13 (right) 10.7 Åum IR channel images (click to play animation)

GOES-13 0.63 Åum visible channel images with overlays of the corresponding University of Wisconsin GOES-13 IR Cloud Top Cooling Rate (CTCR) product (*below; click image to play animation*) indicated that CTCR values exceeded 30 degrees Kelvin per 15 minutes (*darker blue color enhancement*) at 20:45 UTC as the thunderstorm that produced the Wayne tornado was rapidly developing in northeastern Nebraska.

GOES-13 (10/04/2013 - 20:45 UTC)

www.ssd.noaa.gov/goes/east/wfo/index.html

Satellite imagery sources

- » CIMSS GOES Derived Product Imagery
- » CIMSS Tropical Cyclones
- » Environmental Remote Sensing Center, SSEC
- » GIINA (University of Alaska Fairbanks)
- » IDEA-I Aerosols
- » IDEA-I Ozone
- » NWS WFO-scale satellite images (eastern US)
- » NWS WFO-scale satellite images (western US)
- » SOSE Global Satellite Imagery
- » SSEC AMRC Antarctic composite image animations
- » SSEC AMRC Arctic composite image animation
- » SSEC composite GOES-West/GOES-East IR animation
- » SSEC Geostationary Satellite Images
- » SSEC Global IR Mosaic Images
- » SSEC MODIS Direct Broadcast
- » SSEC MODIS Today
- » UW-Madison AOS Satellite Images

Archives

- » May 2014

Training Suggestions

- Have all GOES-R PG Training materials collected in one place (Training Portal?)
- Continue to develop timely “video training” modules (Articulate, Youtube, etc...)
- AWIPS2 archiving ***and playback*** is critical to training, case development, blogging, etc...
- Emphasize how much satellite data helped with the forecast/warning/nowcast problem

Selected Product Evaluations

(those chosen for this meeting)

- CTC/GOES-R CI  ProbSevere
- NUCAPS Soundings

CTC occasionally shows up in OAX AFDs

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE OMAHA/VALLEY NE
1226 AM CDT THU MAY 8 2014

A COUPLE OF AREAS OF POTENTIAL CONVECTION WERE OF NOTE AT EARLY AFTERNOON. ONE EXTENDING FROM NORTH CENTRAL NEBRASKA INTO SOUTH DAKOTA...AND THE OTHER ACROSS CENTRAL KANSAS. CONGESTUS-LOOKING CLOUDS WERE TRYING TO IGNITE IN NORTH CENTRAL NEBRASKA...AND **CLOUD TOP COOLING** ALGORITHMS WERE SUGGESTING A SMALL CHANCE FOR THOSE CLOUDS TO CONVECT. BUT IF THEY DO...THEY WILL MOST LIKELY RIDE NORTH-NORTHEAST INTO SOUTH DAKOTA. SIGNIFICANT CONVECTIVE INHIBITION WAS NOTED OVER THIS AREA...SO THERE IS A MUCH BETTER CHANCE NOTHING WILL GO CLOSE TO OUR AREA...FOCUSING ACTIVITY MORE IN WESTERN NEBRASKA AND THE FOOTHILLS WHERE INHIBITION IS LOW.

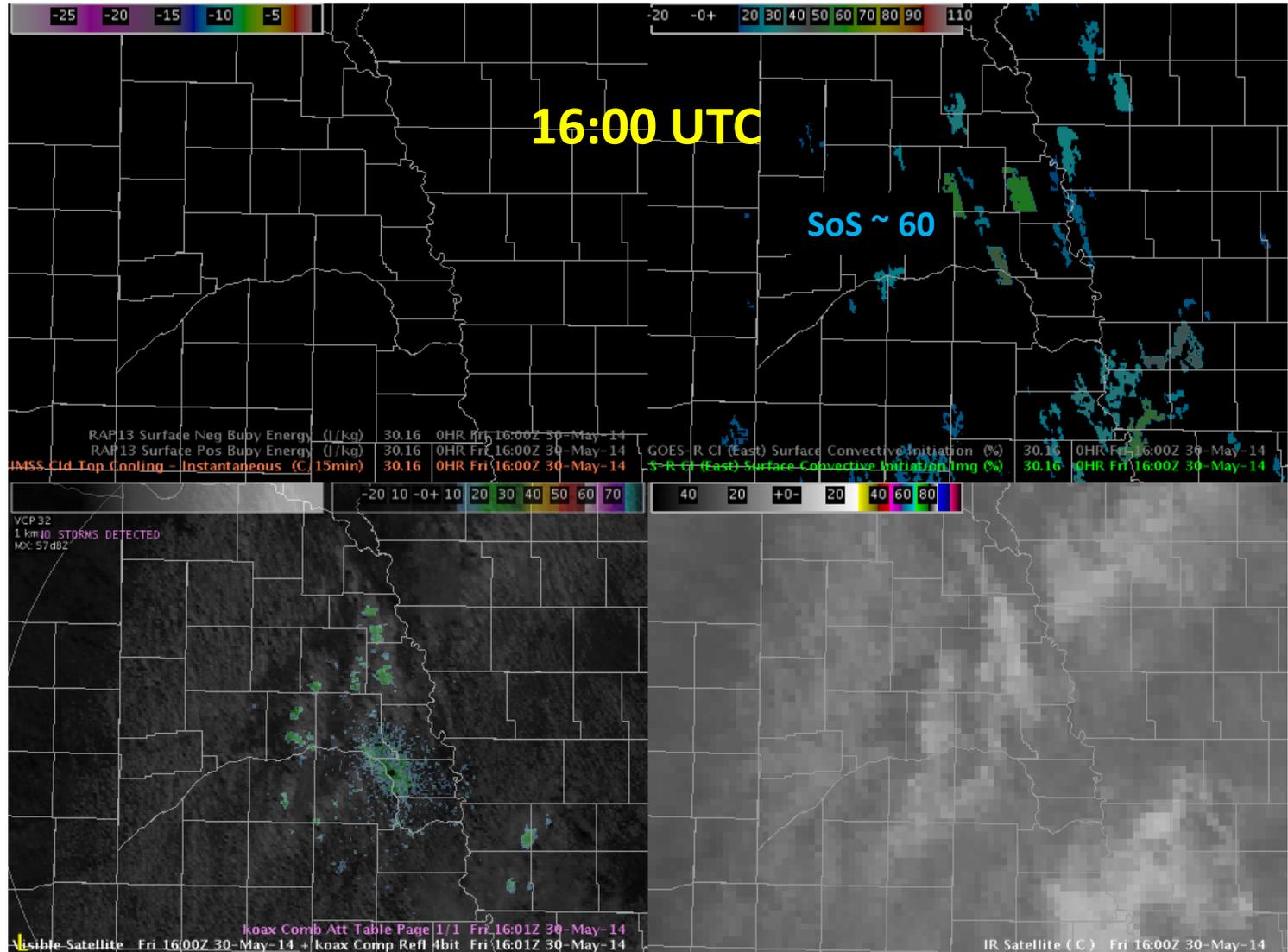
CTC / GOES-R CI Example

30 May 2014

CI Stage

Standard
AWIPS2
4-Panel

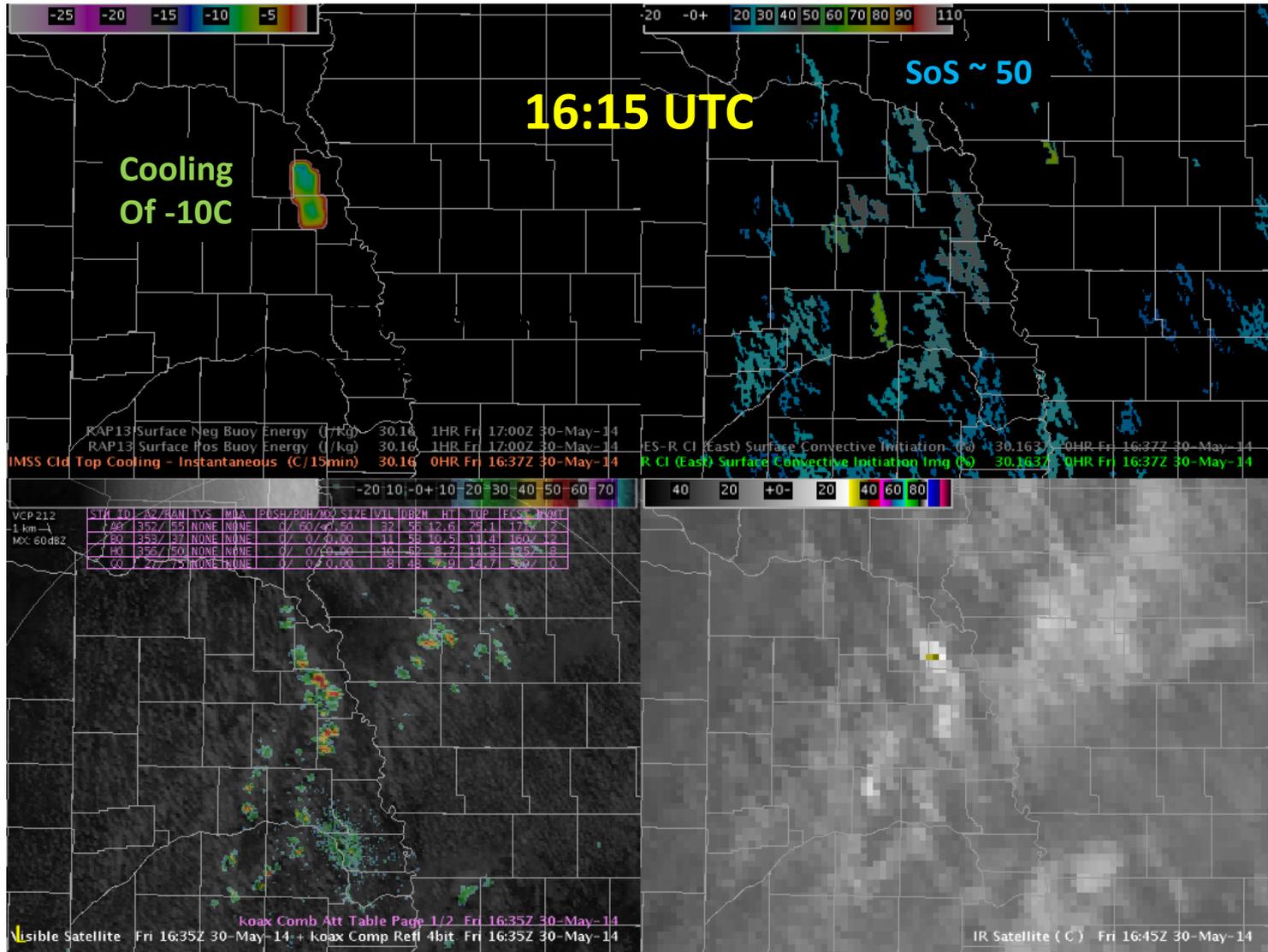
Some have
additional
fields such
as various
environmental
parameters



CTC / GOES-R CI Example

30 May 2014

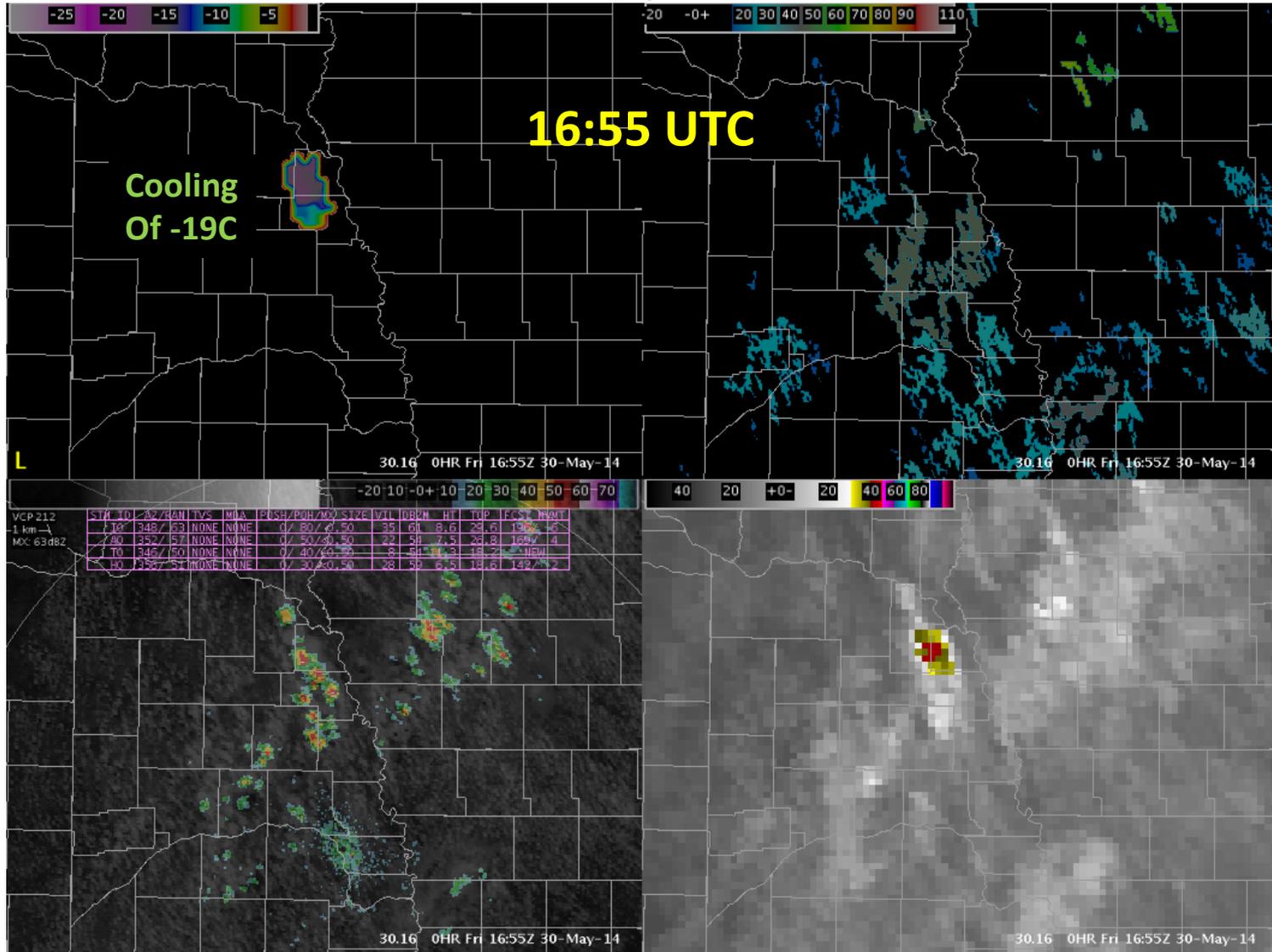
Assessing
Severity
Stage



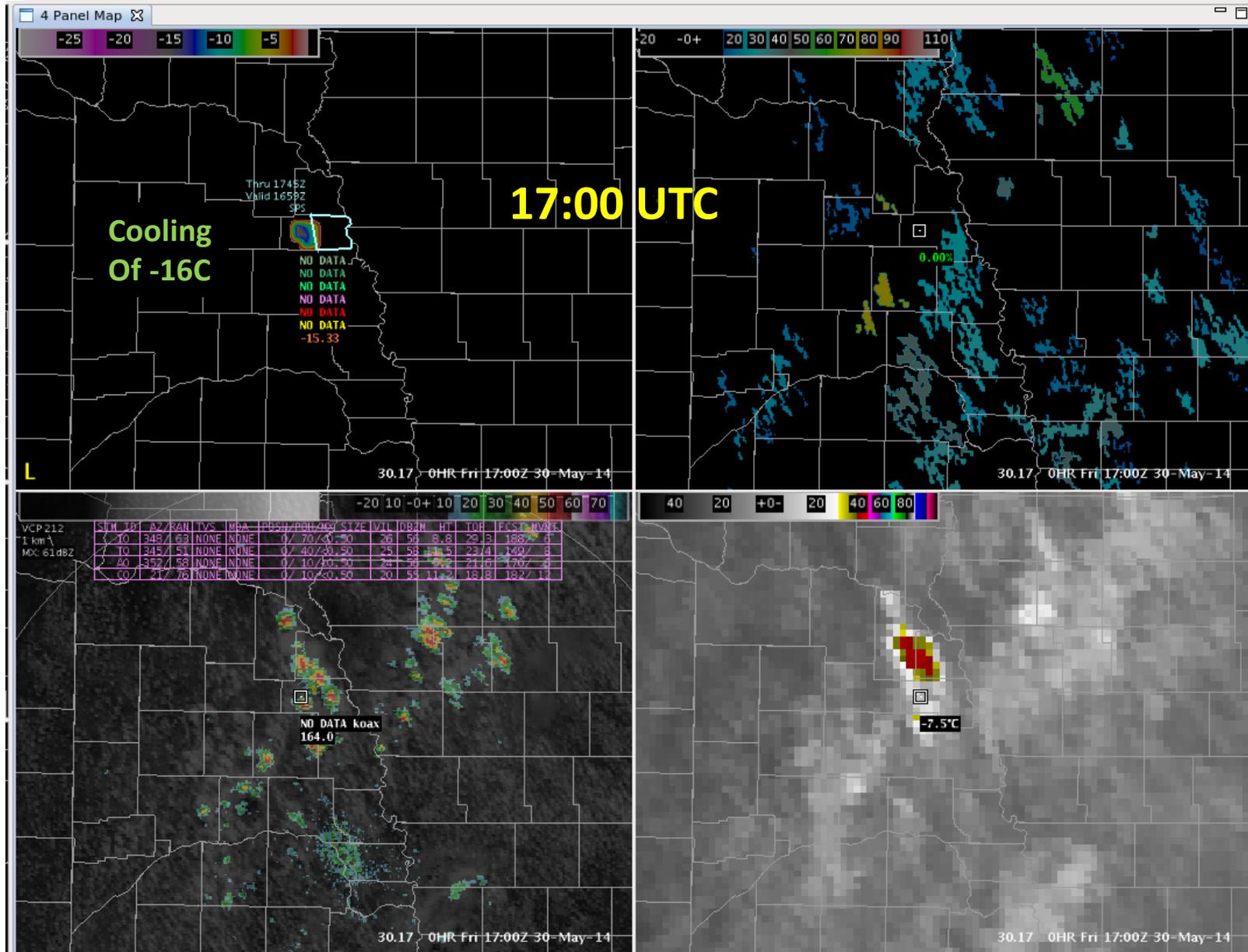
CTC / GOES-R CI Example

30 May 2014

Assessing
Severity
Stage

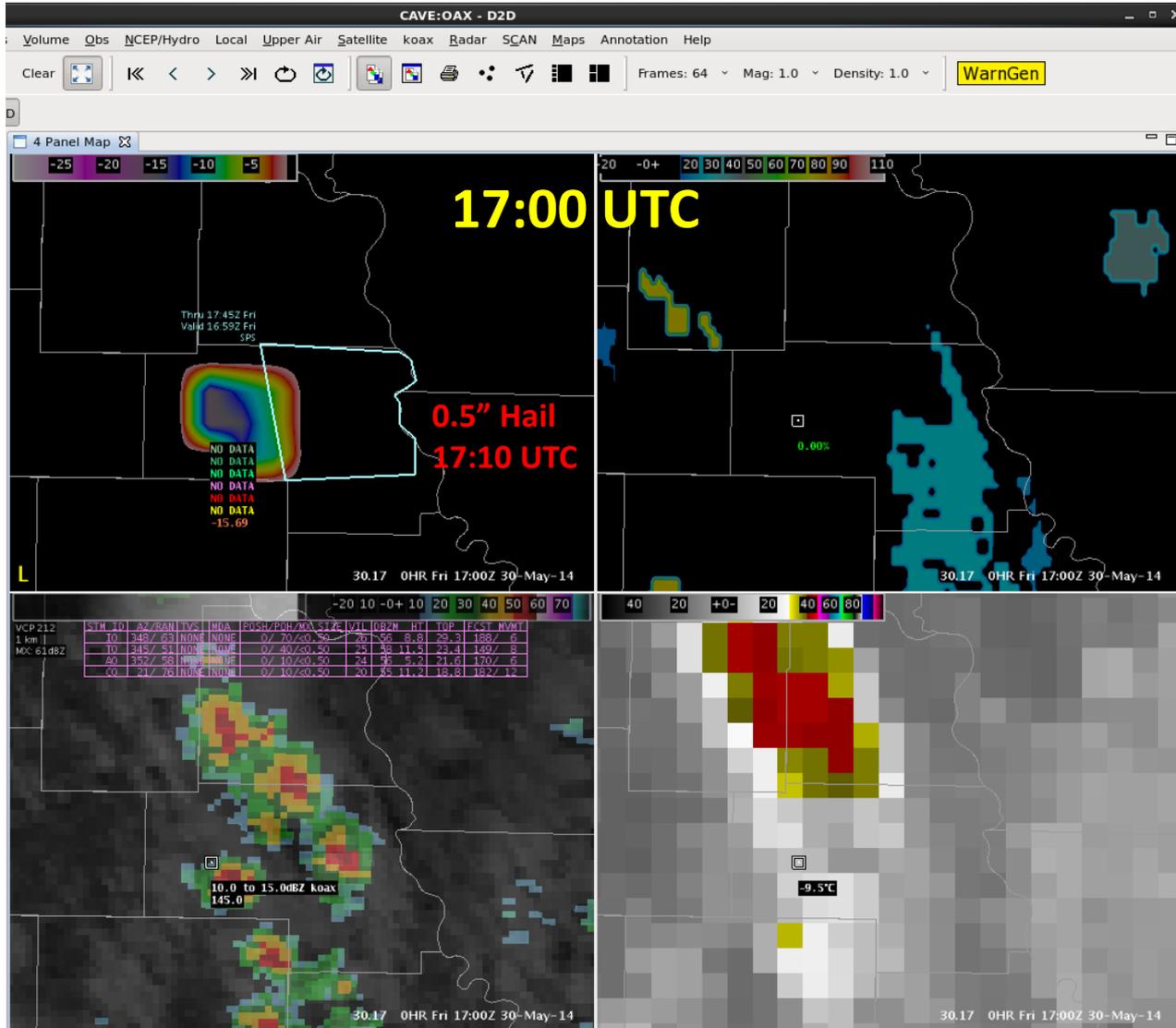


2D



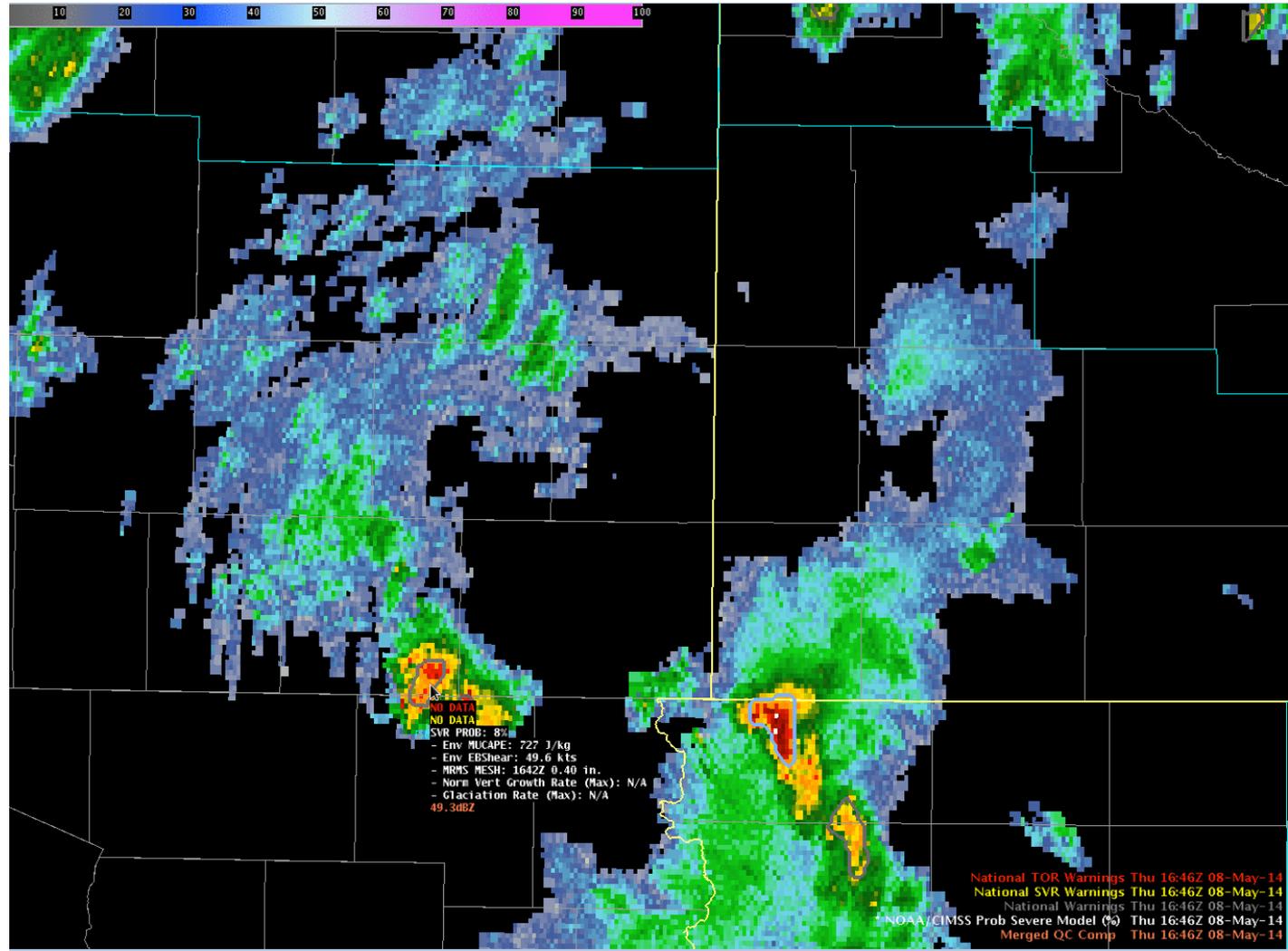
CTC / GOES-R CI Example

30 May 2014



ProbSevere (CIMSS)

TOAX Hopeful... Web Interface for now

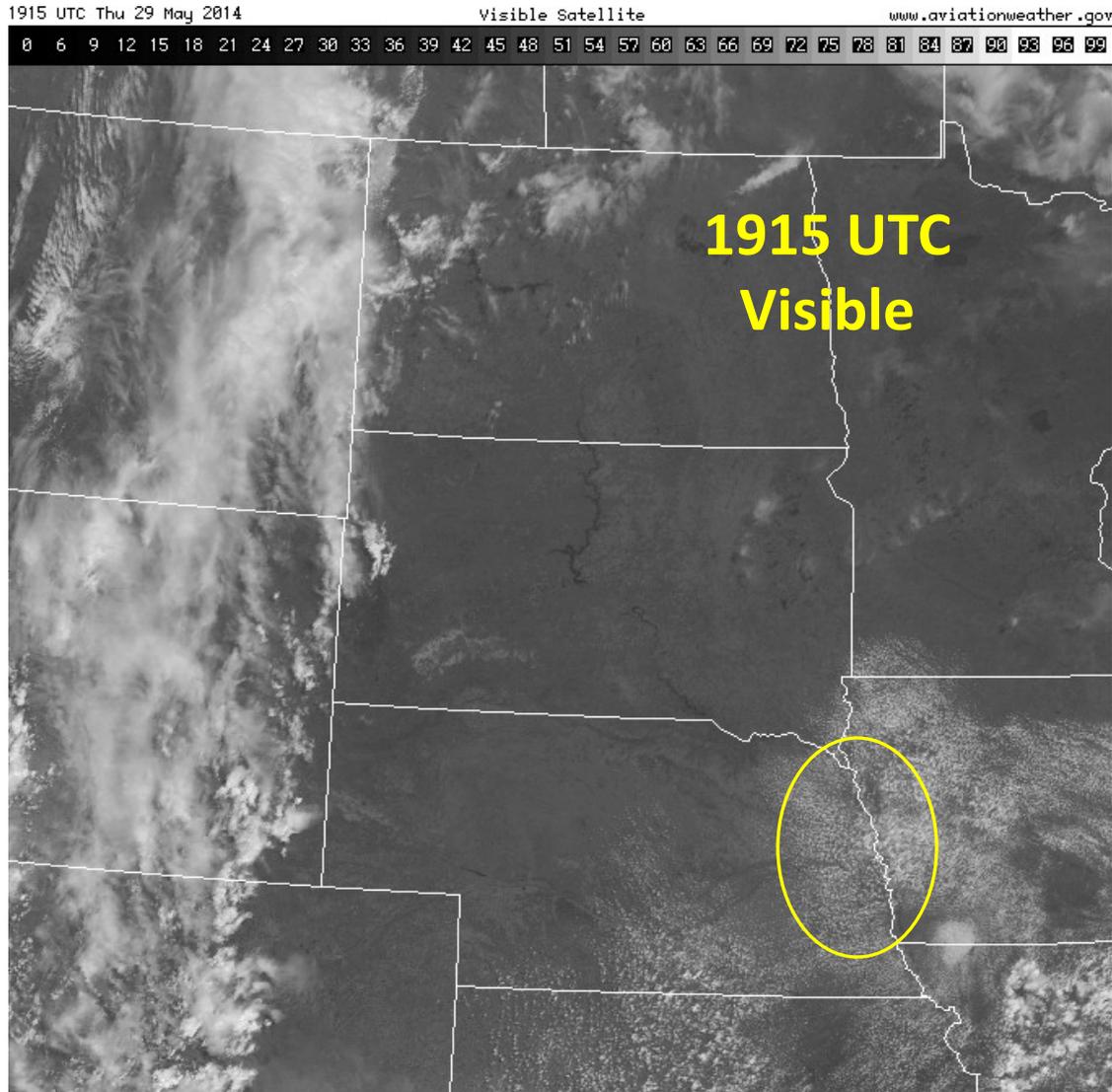


TOAX AWIPS2

Build 14.3

Testbed System

29 May 2014 Forecast Problem: Afternoon/Evening Convection ???

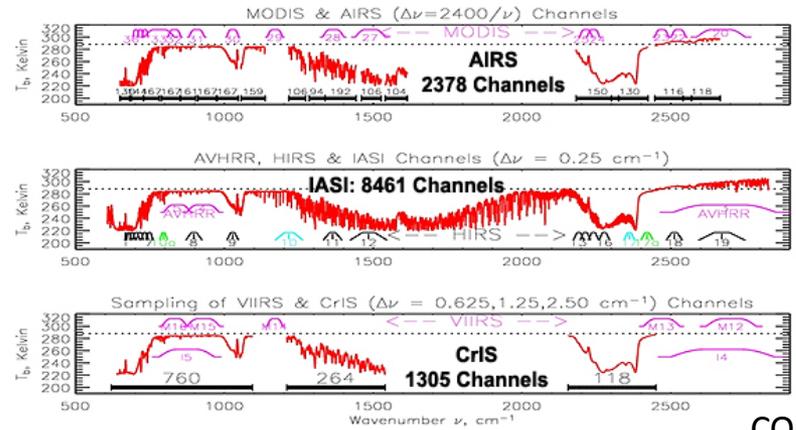


GFS 9 hour fcst
From 12UTC 29 May
Valid 21 UTC 29 May

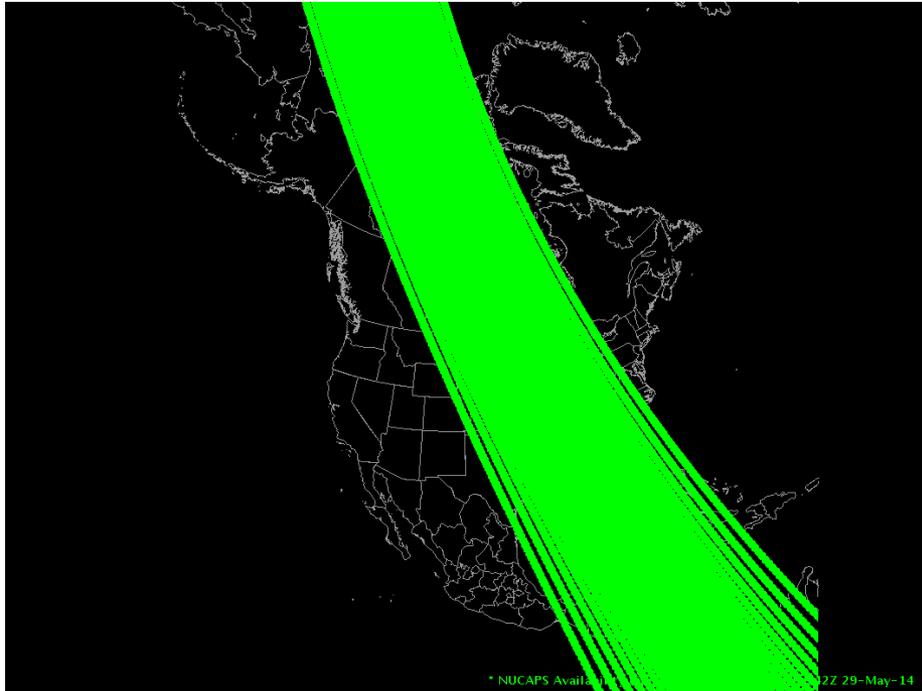


NPP NUCAPS Soundings

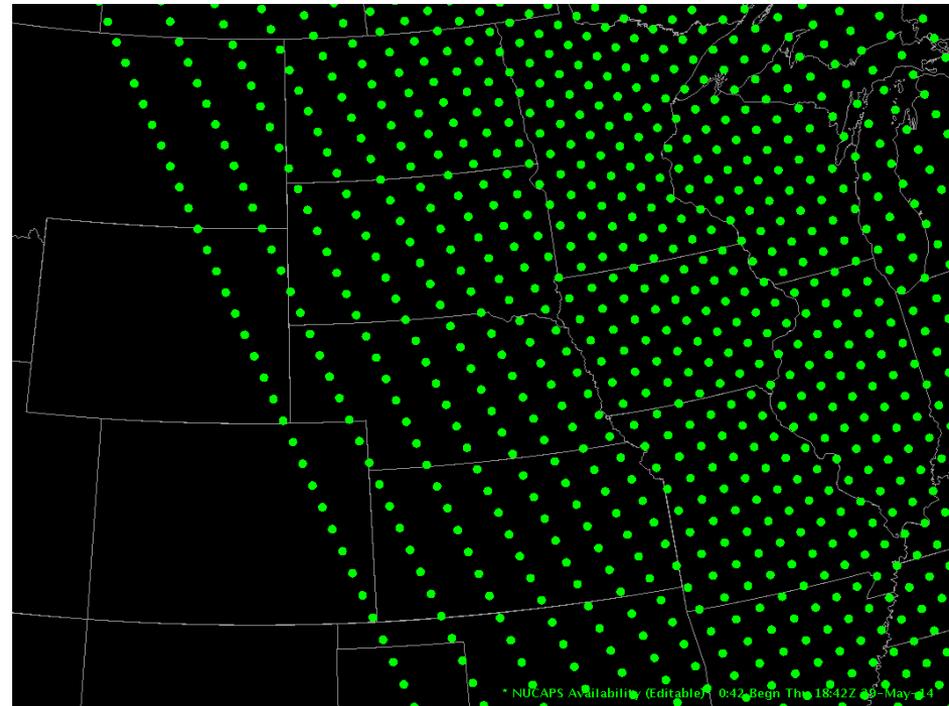
Spectral Coverage and Example Observations of AIRS, IASI, and CrIS



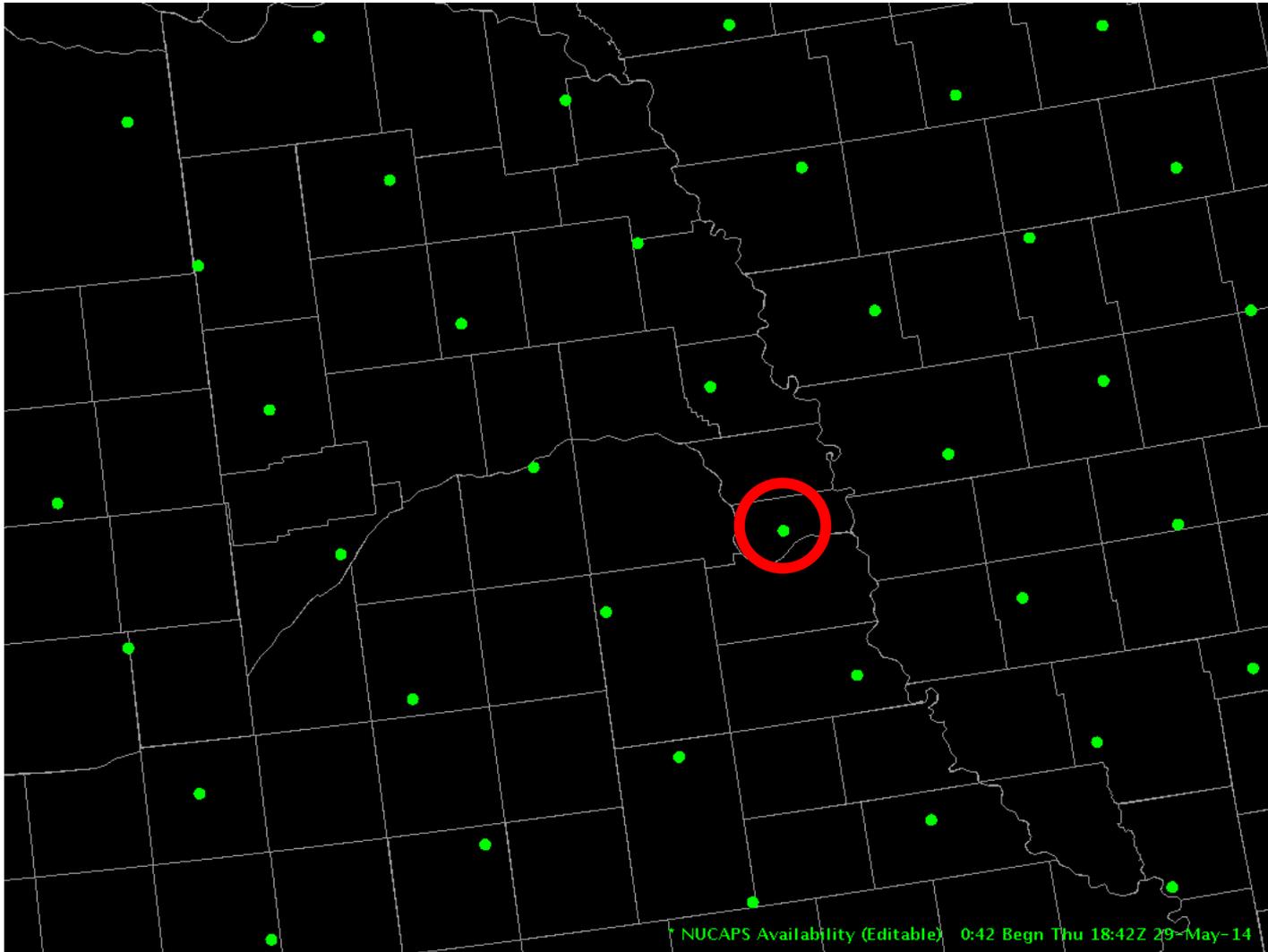
COMET



1842 UTC NPP pass

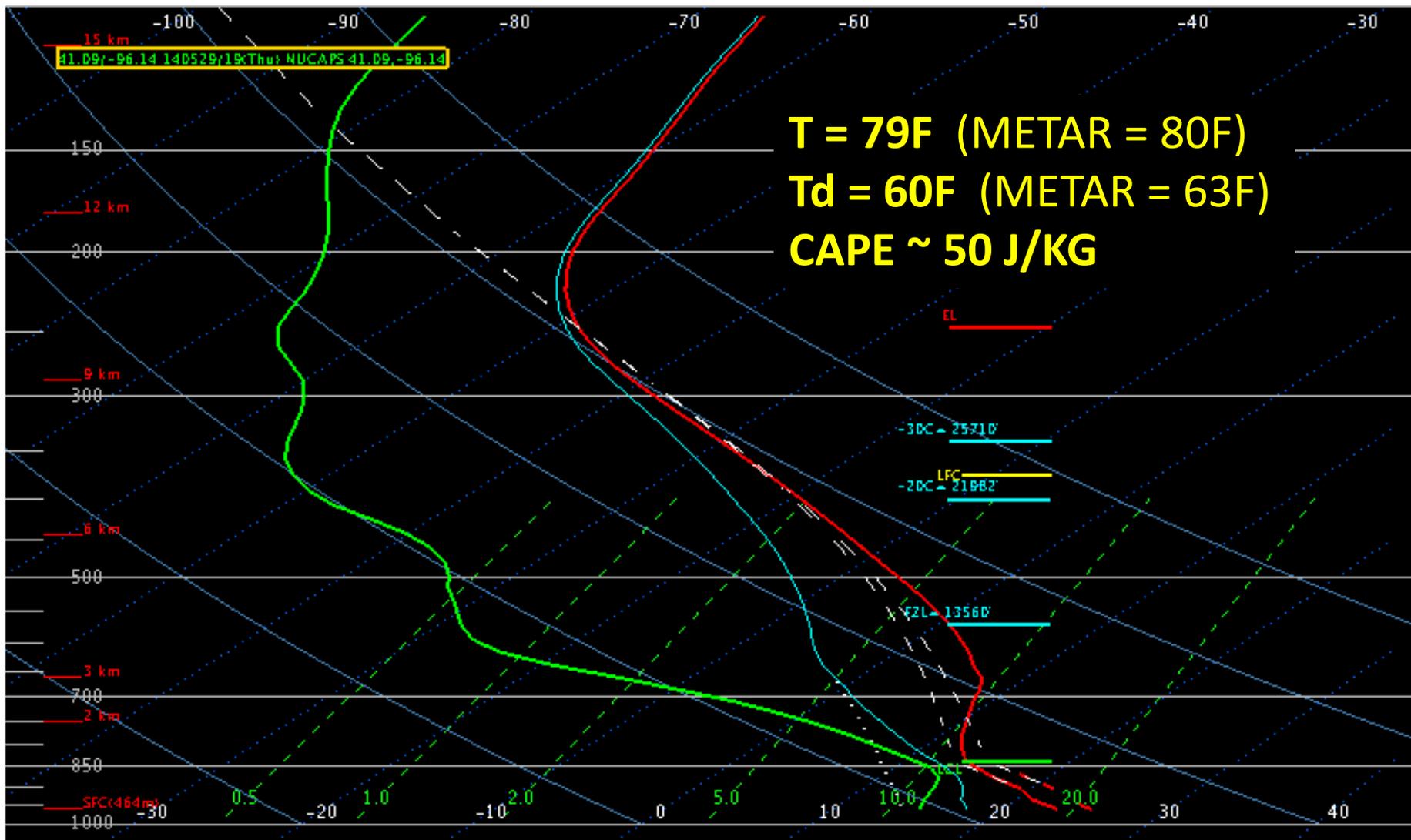


NUCAPS Example from 29 May 2014

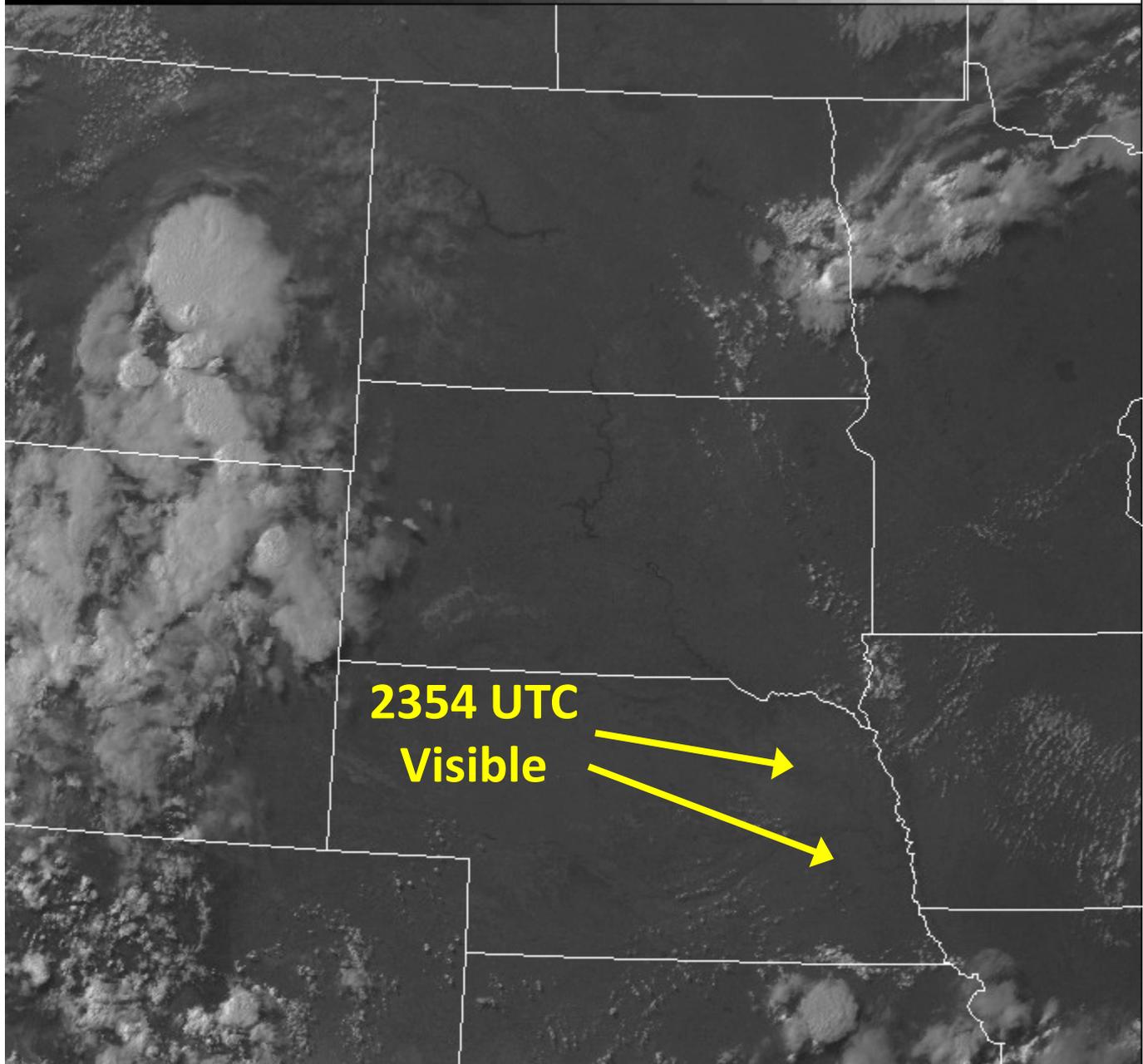


1842 UTC NUCAPS Sounding

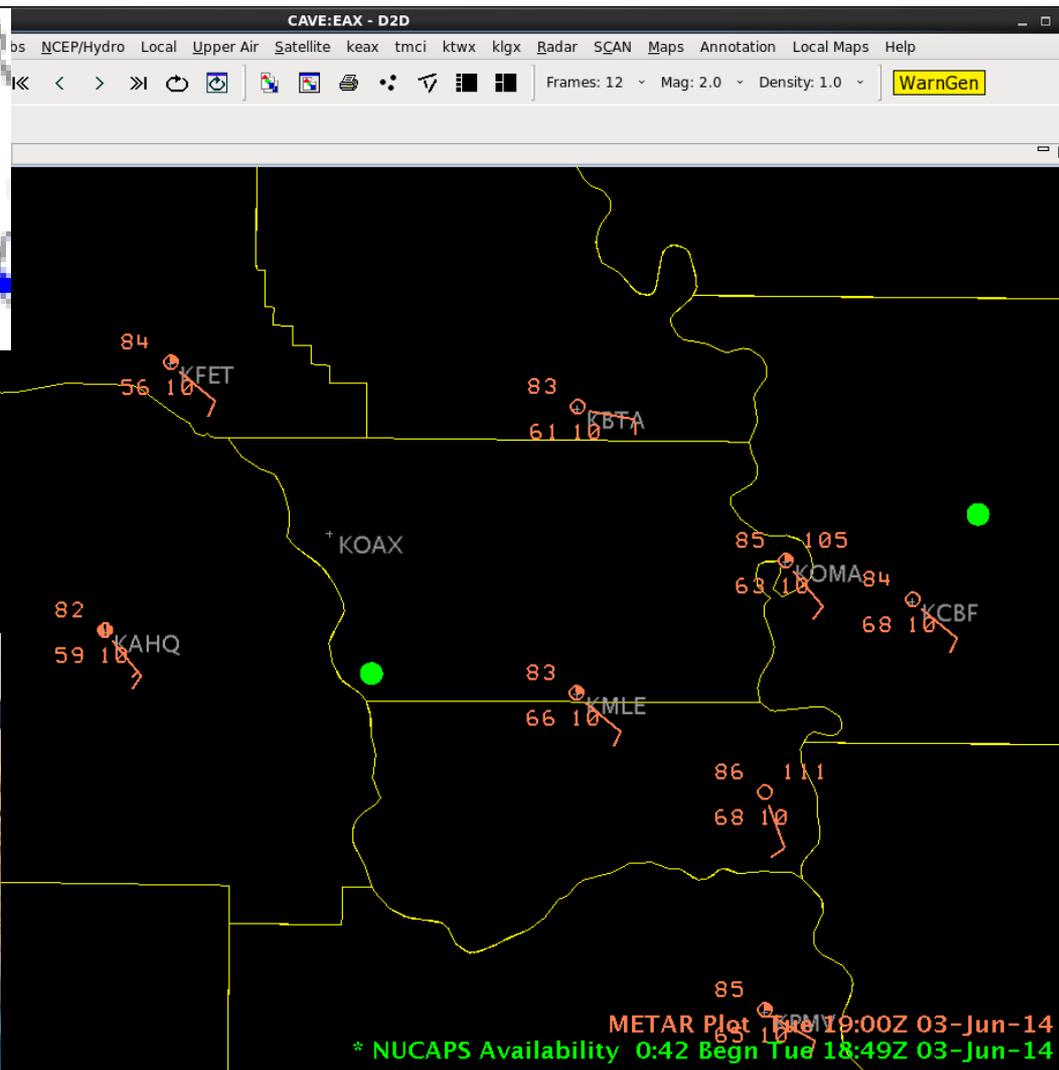
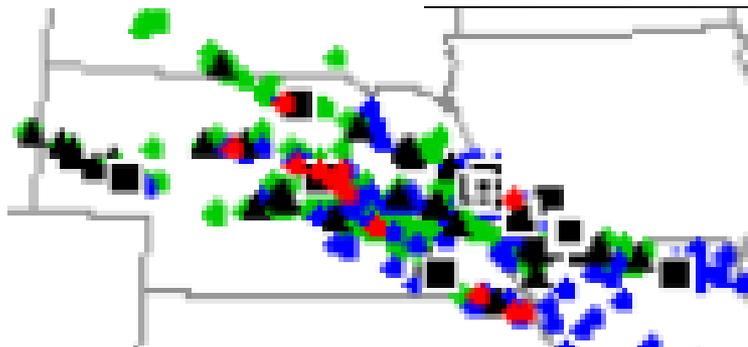
29 May 2014



0 6 9 12 15 18 21 24 27 30 33 36 39 42 45 48 51 54 57 60 63 66 69 72 75 78 81 84 87 90 93 96 99



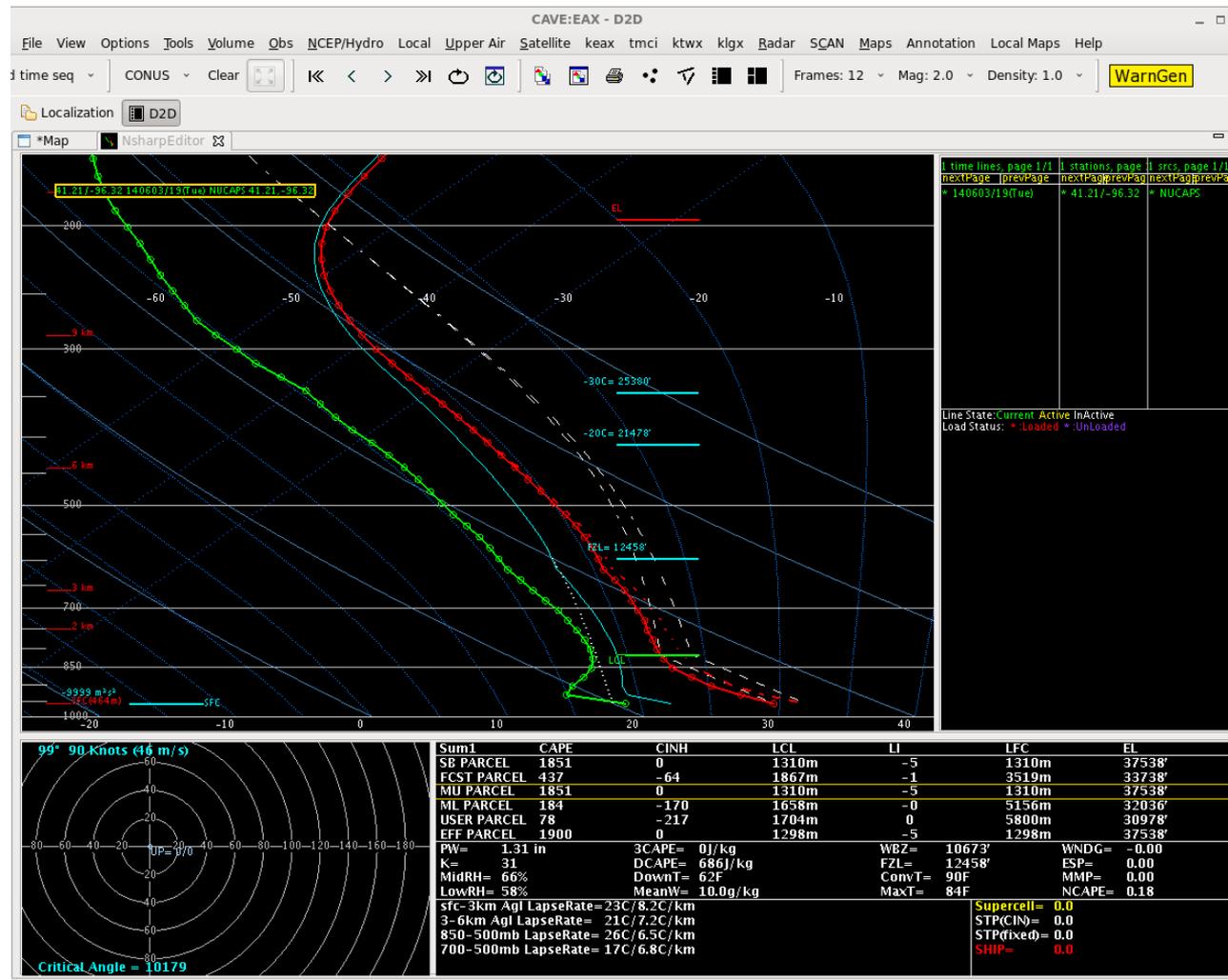
June 3, 2014 High Risk Severe Weather Event in Omaha



June 3, 2014 High Risk Severe Weather Event in Omaha

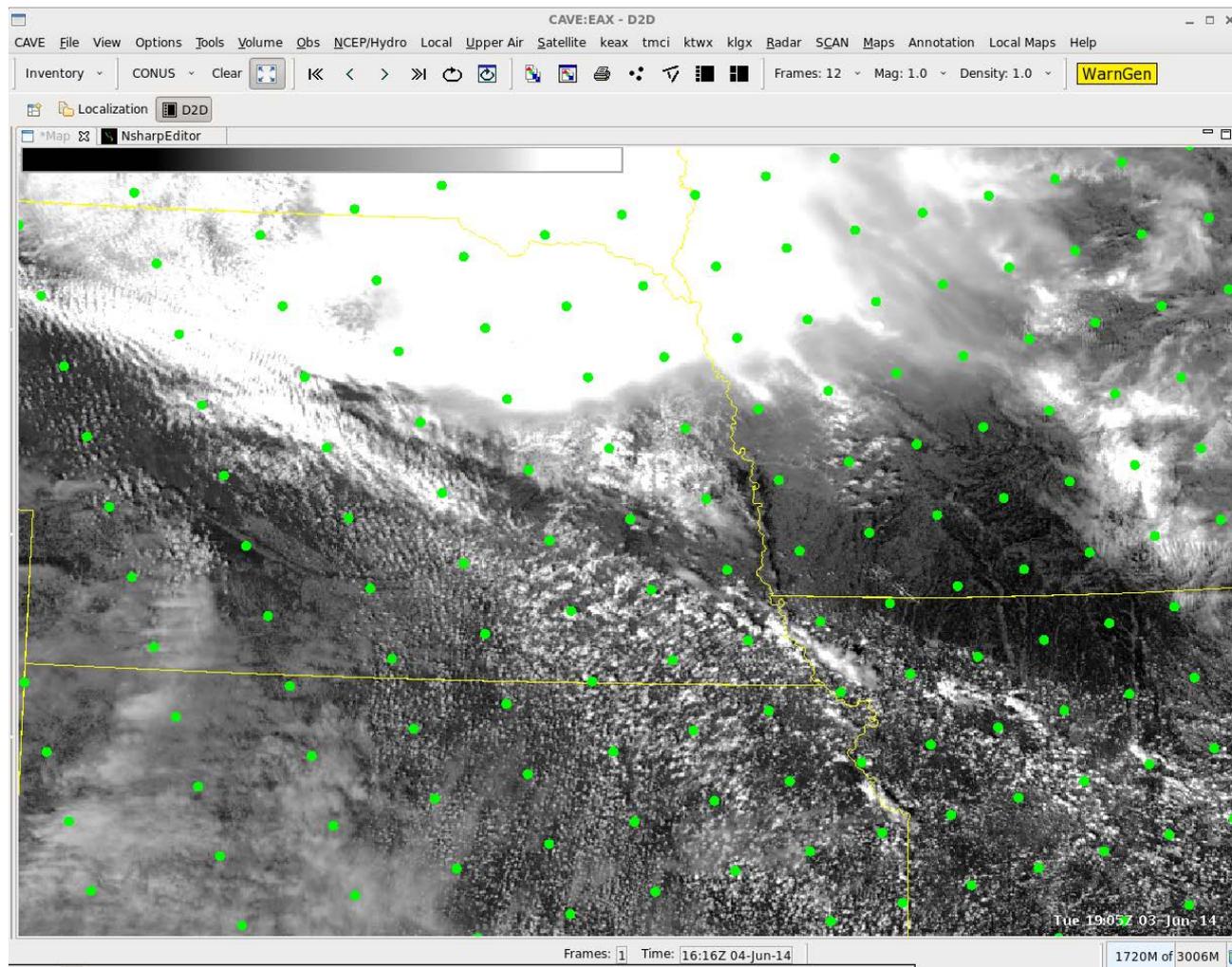
NUCAPS ~10 KM south of OAX
1849Z June 3, 2014

Modified for surface METAR
Ob of T=83, Td=63
SB CAPE = 1851



June 3, 2014 High Risk Severe Weather Event in Omaha

NUCAPS sounding locations
Overlaid with VIIRS 0.64
1905Z June 3, 2014



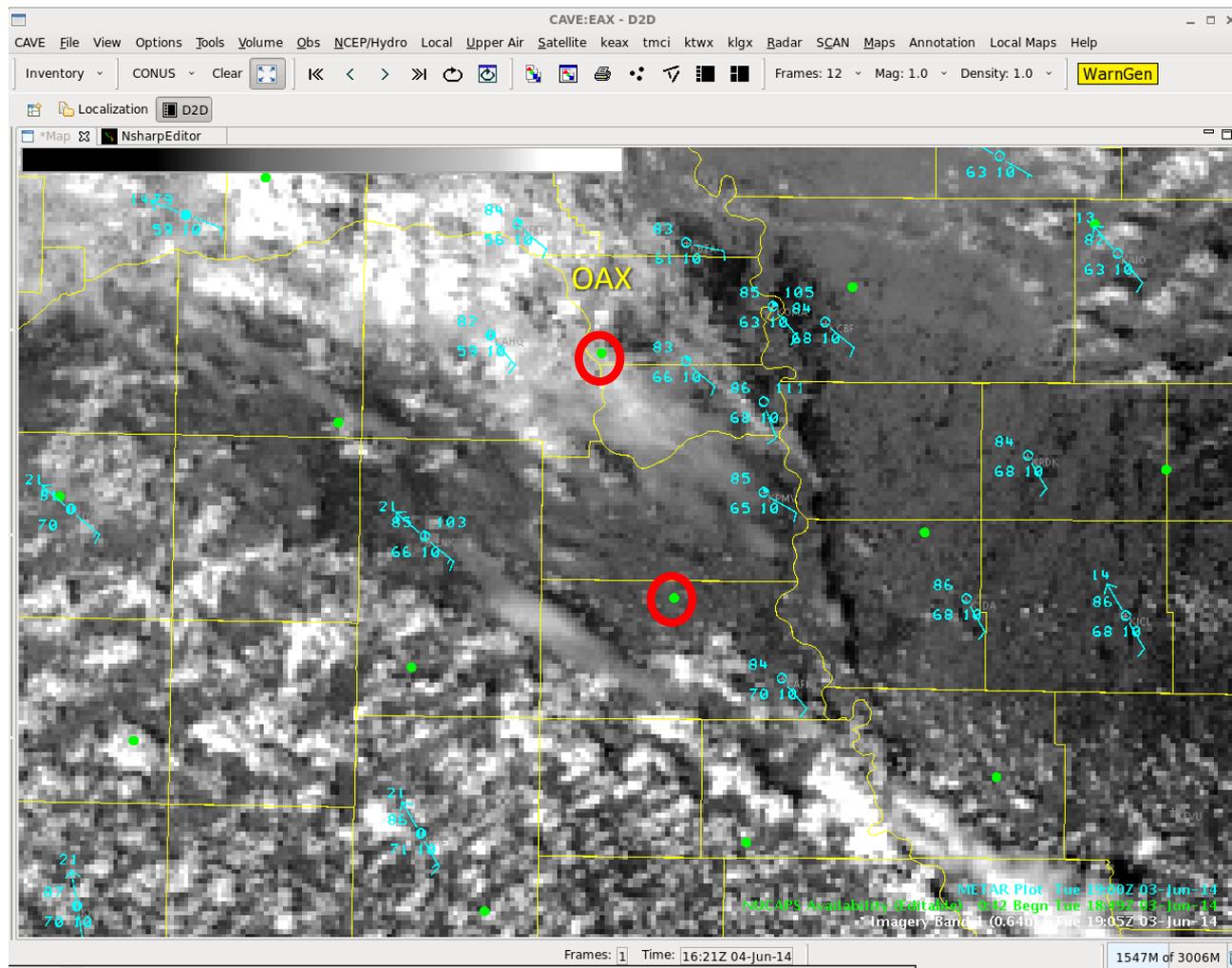
June 3, 2014 High Risk Severe Weather Event in Omaha

NUCAPS sounding locations
Overlaid with VIIRS 0.64
1905Z June 3, 2014

Location of OAX in yellow

Northern dot is within a few
KM of KOAX, but under
cloud cover

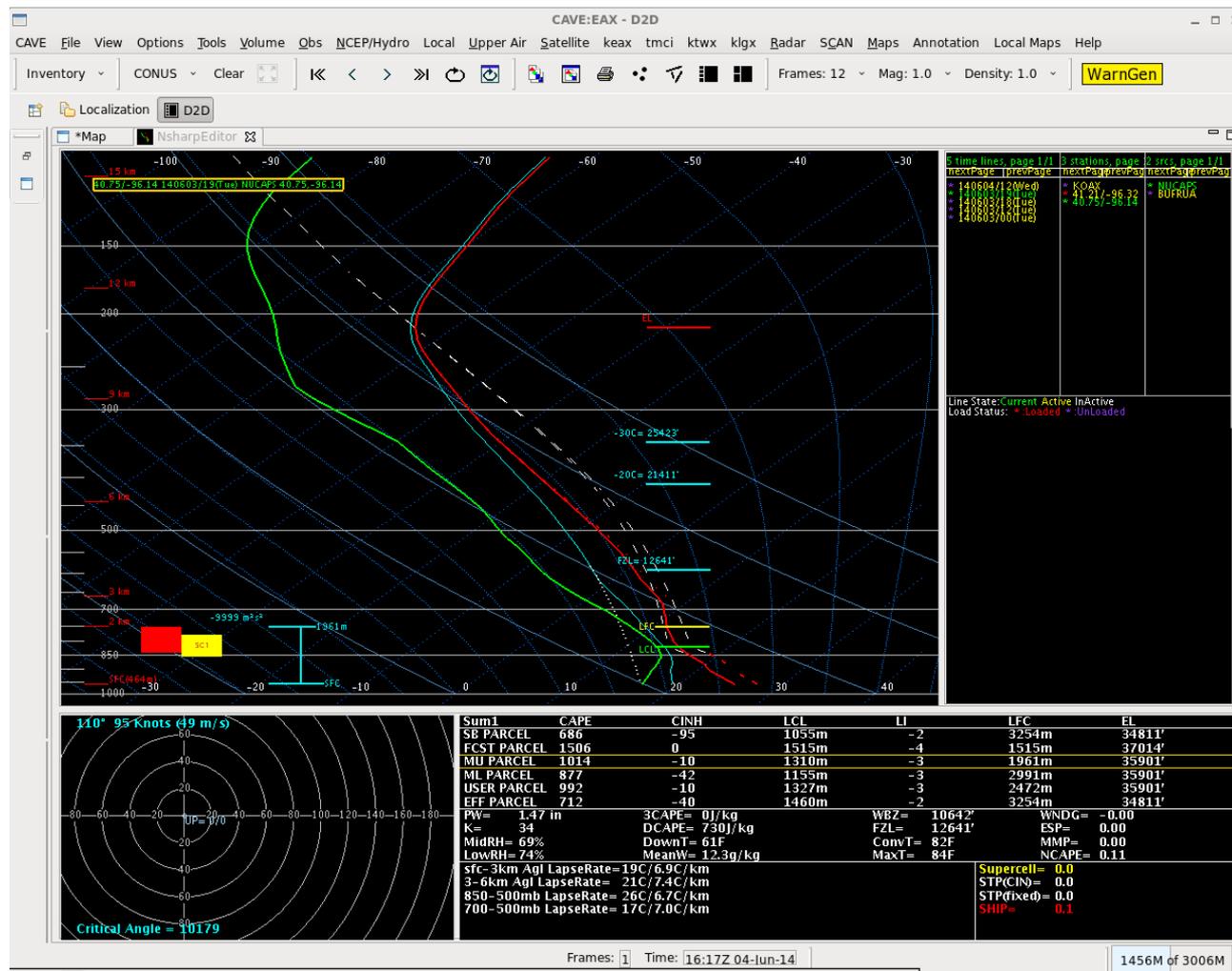
Southern dot is in a nearly
Cloud-free location, and is
warmer and more humid



June 3, 2014 High Risk Severe Weather Event in Omaha

NUCAPS sounding
40KM south of OAX
1849Z June 3, 2014

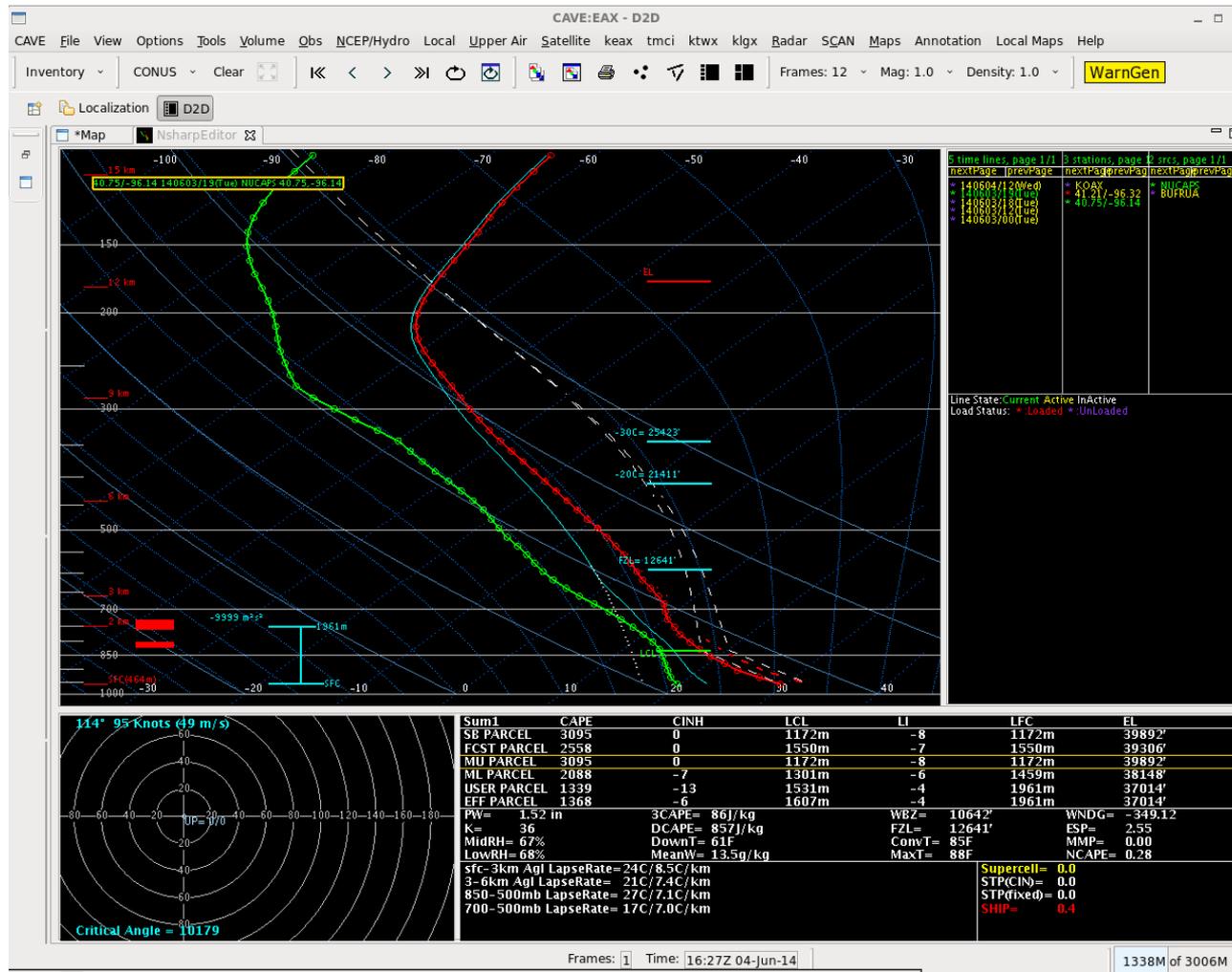
Unmodified
SB CAPE = 686



June 3, 2014 High Risk Severe Weather Event in Omaha

NUCAPS sounding
40KM south of OAX
1849Z June 3, 2014

Modified for surface METAR
Ob of T=85, Td=68
SB CAPE = 3095



Ready for Users?

- CTC:
 - Already being used to assess updraft strength
 - Combine with environmental parameters (best use)
{COMET GOES-R COOP Project WFO OAX – University of Nebraska Lincoln}
- GOES-R CI:
 - Already being used for CI, although more experience needed at OAX
 - We cut out low SoS indications
- ProbSevere:
 - Seems promising for identifying SVR candidates
 - Actually seems more than promising – next significant jump in lead time?
 - Statistical model input somewhat simple now...but tremendous potential
- NUCAPS:
 - Shows good potential for sounding data
 - Forecasters very excited, despite imperfections

THANK YOU
to this entire group
for providing these products,
and for this opportunity

Daniel Nietfeld
Science and Operations Officer

NWS WFO Omaha

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