GOES-R Proving Ground

Demonstration of Imagery Products at NOAA's Storm Prediction Center and Hazardous Weather Testbed

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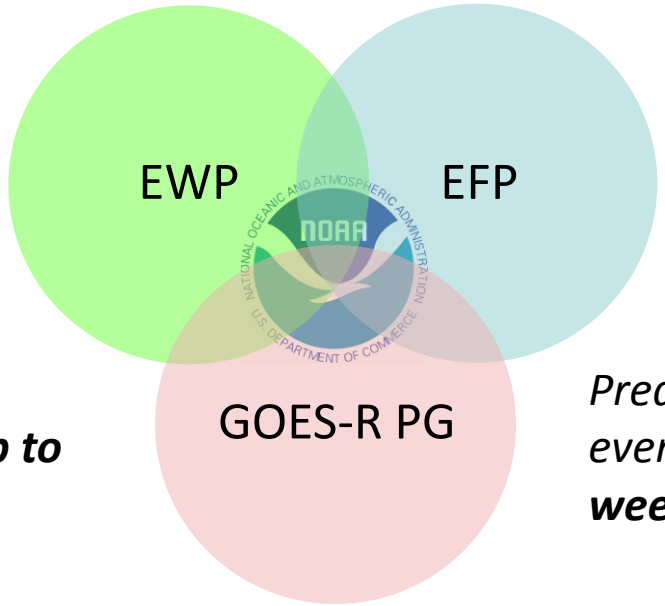
1 - OU-CIMMS, 2 - NOAA/NSSL, 3 - UW-CIMSS, 4 - CIRA, 5 - HPC/OPC/SAB/TAFB, 6 - NASA SPoRT, 7 - NOAA/NWS/SPC

GOES-R Science Week
1 May 2012

NOAA's Hazardous Weather Testbed

Experimental
Warning
Program

Detection and prediction of hazardous weather events ***up to several hours in advance***



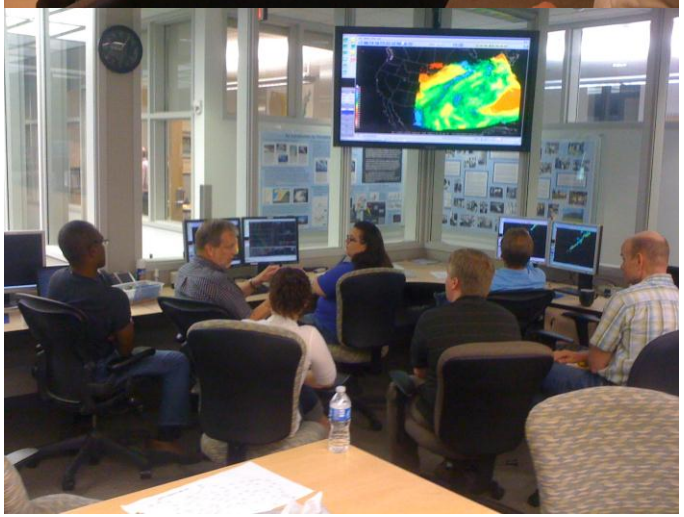
Experimental
Forecast
Program

Prediction of hazardous weather events from ***a few hours to a week in advance***

NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION U.S. DEPARTMENT OF COMMERCE
NASA
CONNECTING RESEARCH AND OPERATIONS GOES-R PROVING GROUND
NATIONAL SEVERE STORMS LABORATORY
Storm Prediction Center Norman, Oklahoma

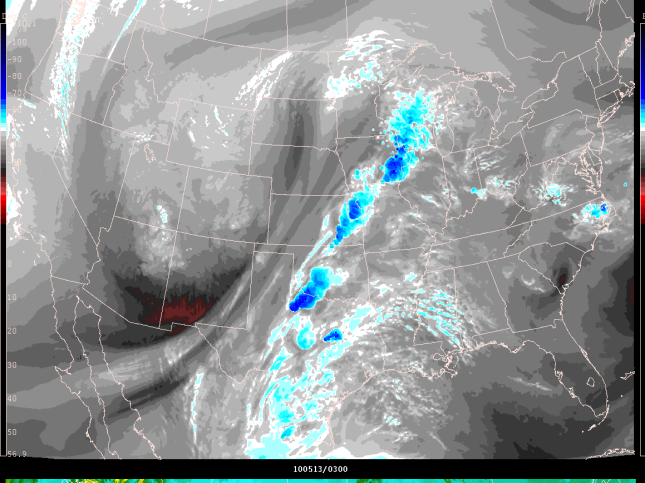
2011 Spring Experiment

- 5-week period (9 May – 10 June)
  - During central plains peak severe weather season
  - Main focus on severe, QPF and CI
- 24 NWS forecasters and many visiting scientists participated
- 8 Proving Ground products demonstrated
- Real-time forecast and warning exercises using operational decision support tools
  - N-AWIPS and AWIPS
- Weather Event Simulator (WES) cases developed for training purposes



Simulated Satellite Imagery

- Produced from the 0Z 4km NSSL-WRF
  - All 9 non-solar ABI IR bands
  - Visible band
  - Band differences
  - Hourly output available for 12-36 hr forecast periods
  - Most imagery available locally by 12Z
- Now being produced in CAPS ensemble (2012)
  - Simulated IR in 23 members (28 overall)
  - Ensemble probability of cloud shield < -52 C and < -32 C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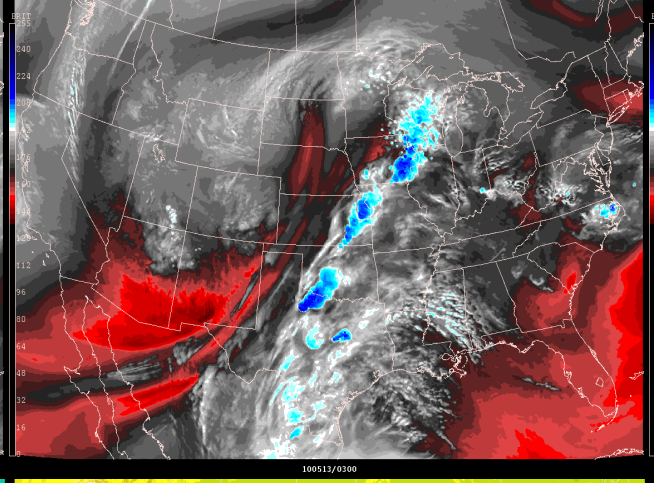
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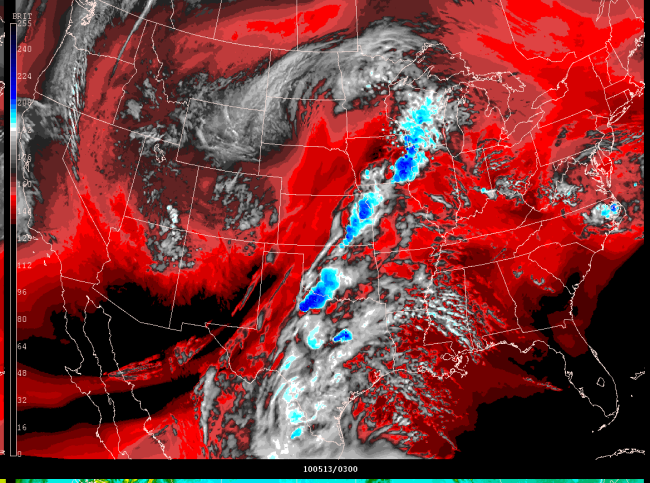
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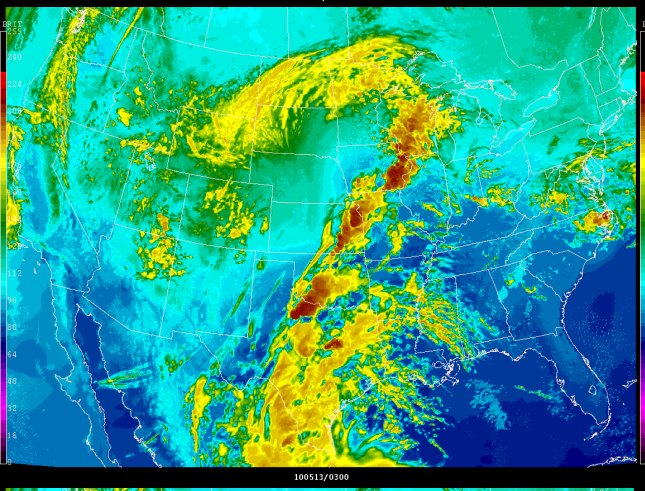
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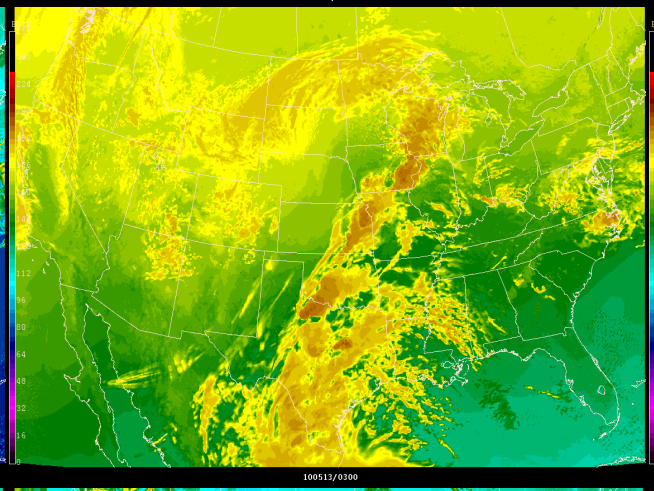
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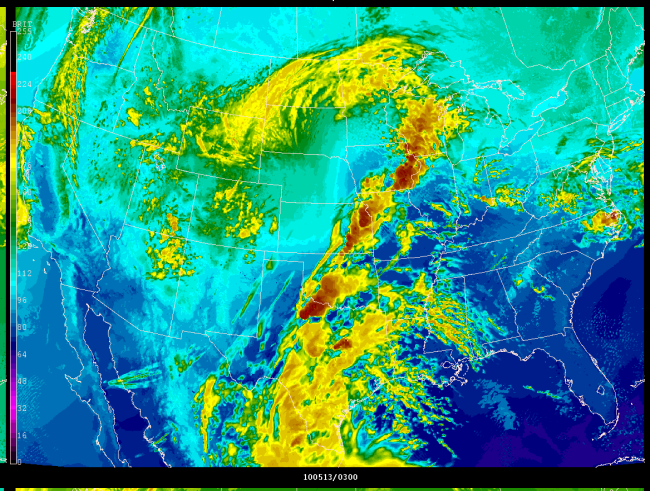
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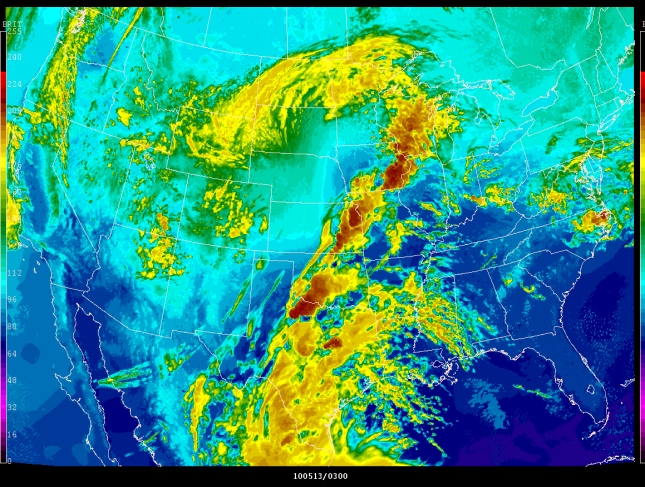
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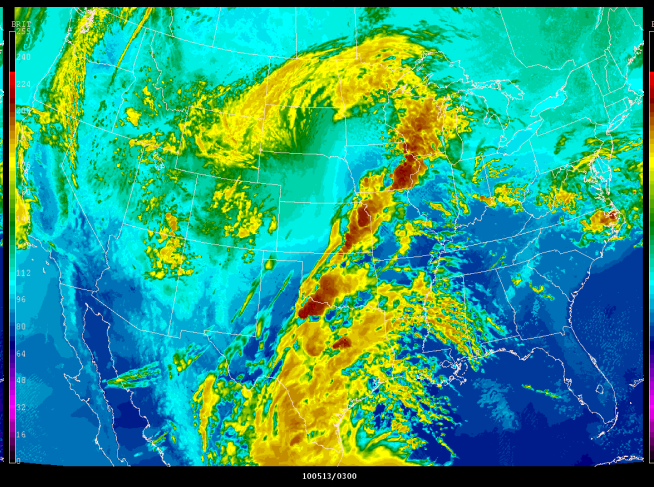
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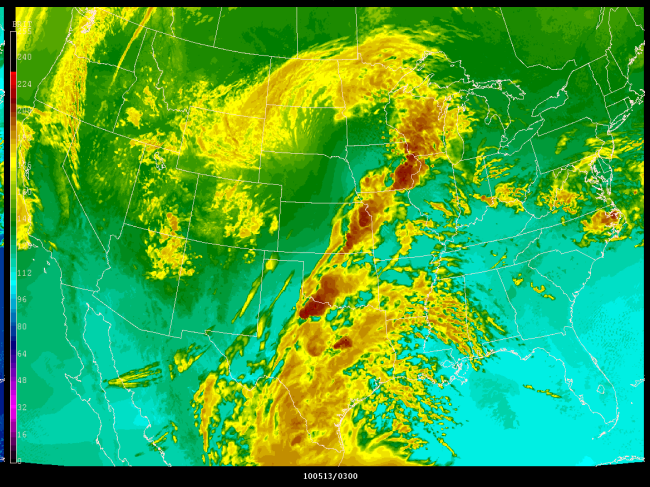
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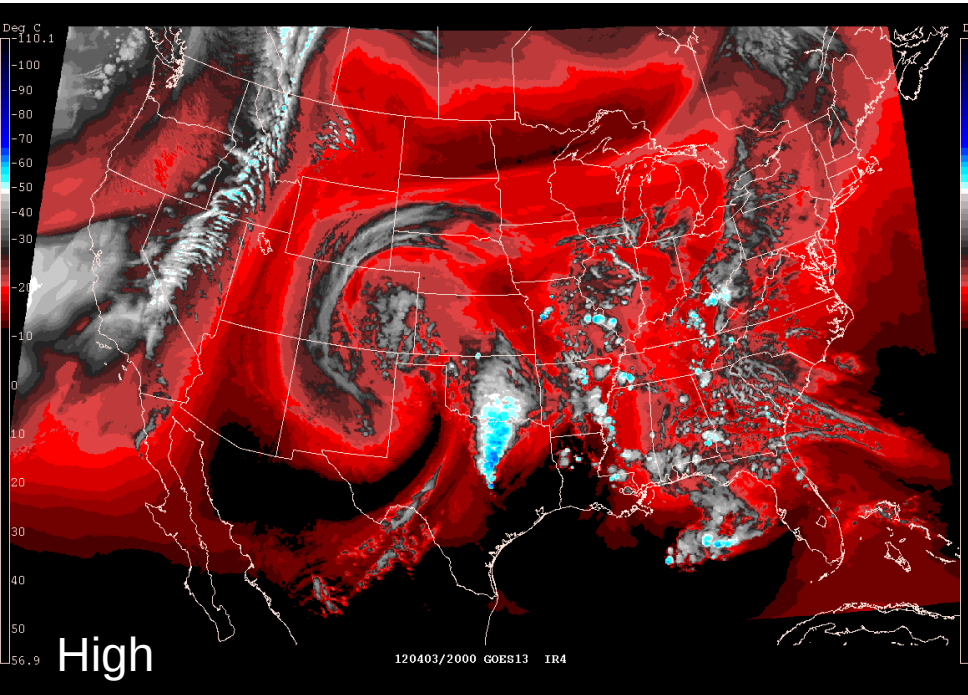
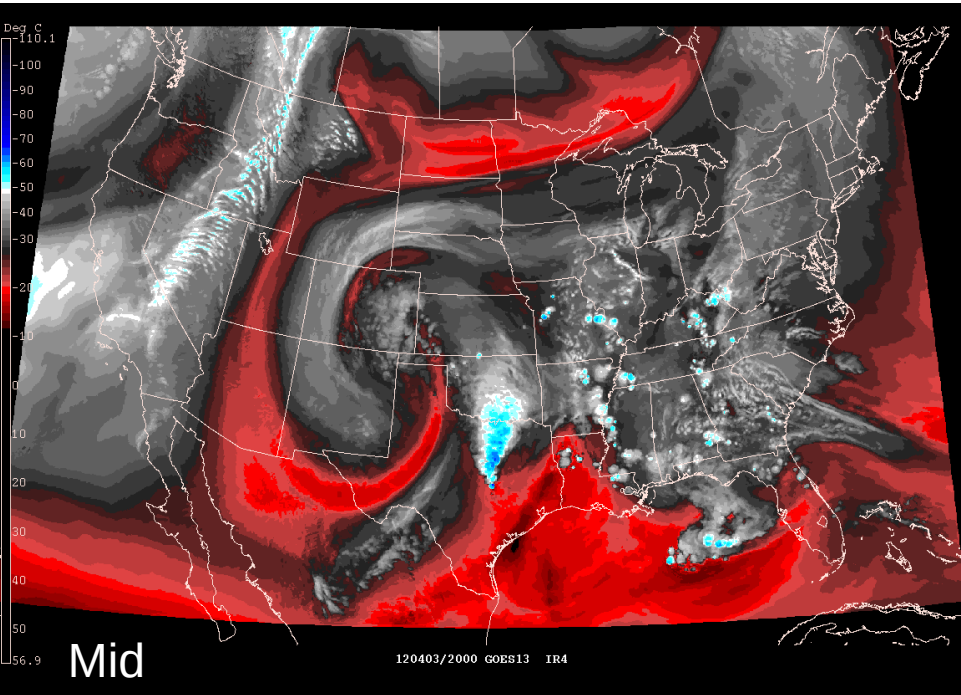

High
120403/2000 GOES13 IR4


Mid
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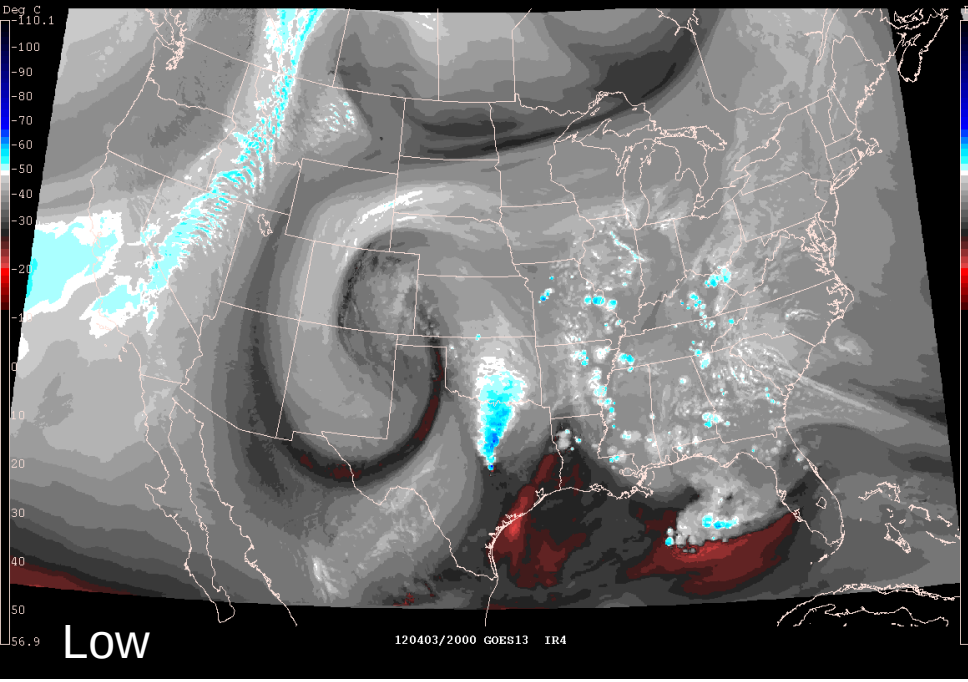
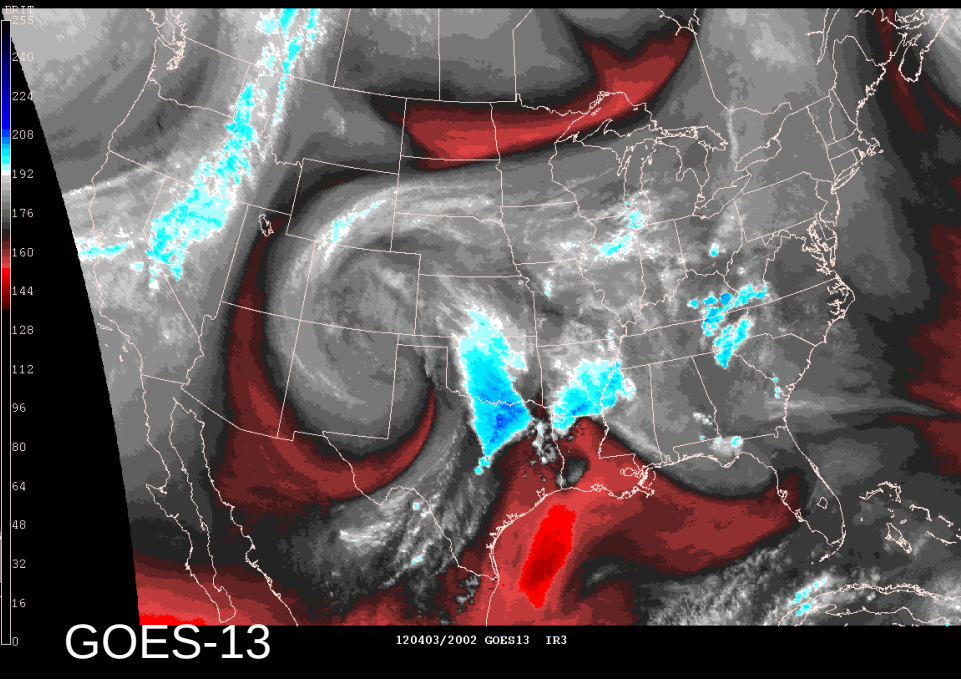
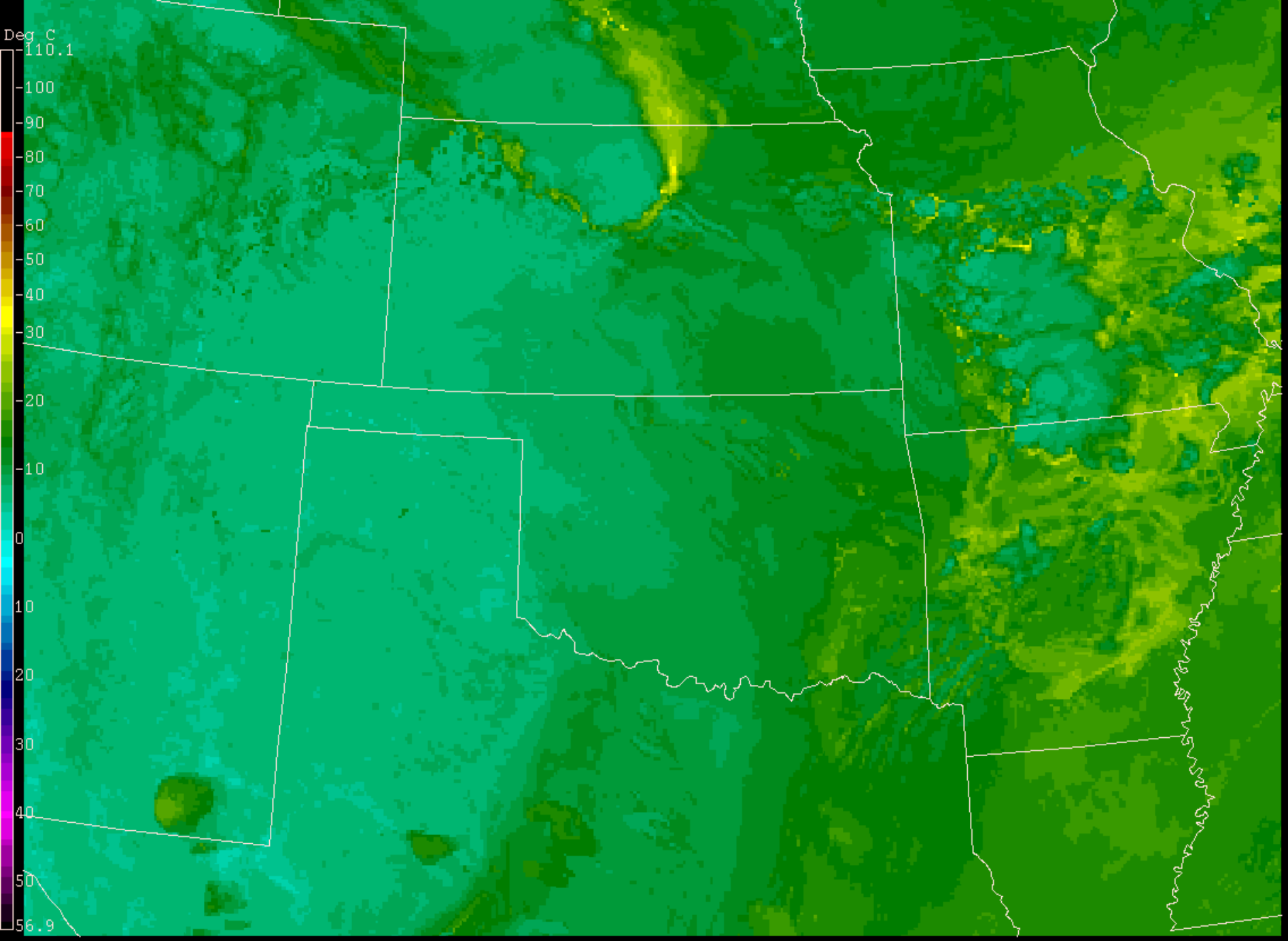

Low
120403/2000 GOES13 IR4


GOES-13
120403/2002 GOES13 IR3

10-12 µm Channel Difference

- Bands currently not available on GOES
- 10.35 µm channel is a ‘clean’ window
  - Brightness temperature very sensitive to surface temperature
- 12.3 µm channel is sensitive to column WV
  - Brightness temperature cools as WV increases
- Difference becomes more positive as low- and mid-level WV increases


Deg C
110.1
100
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10
20
30
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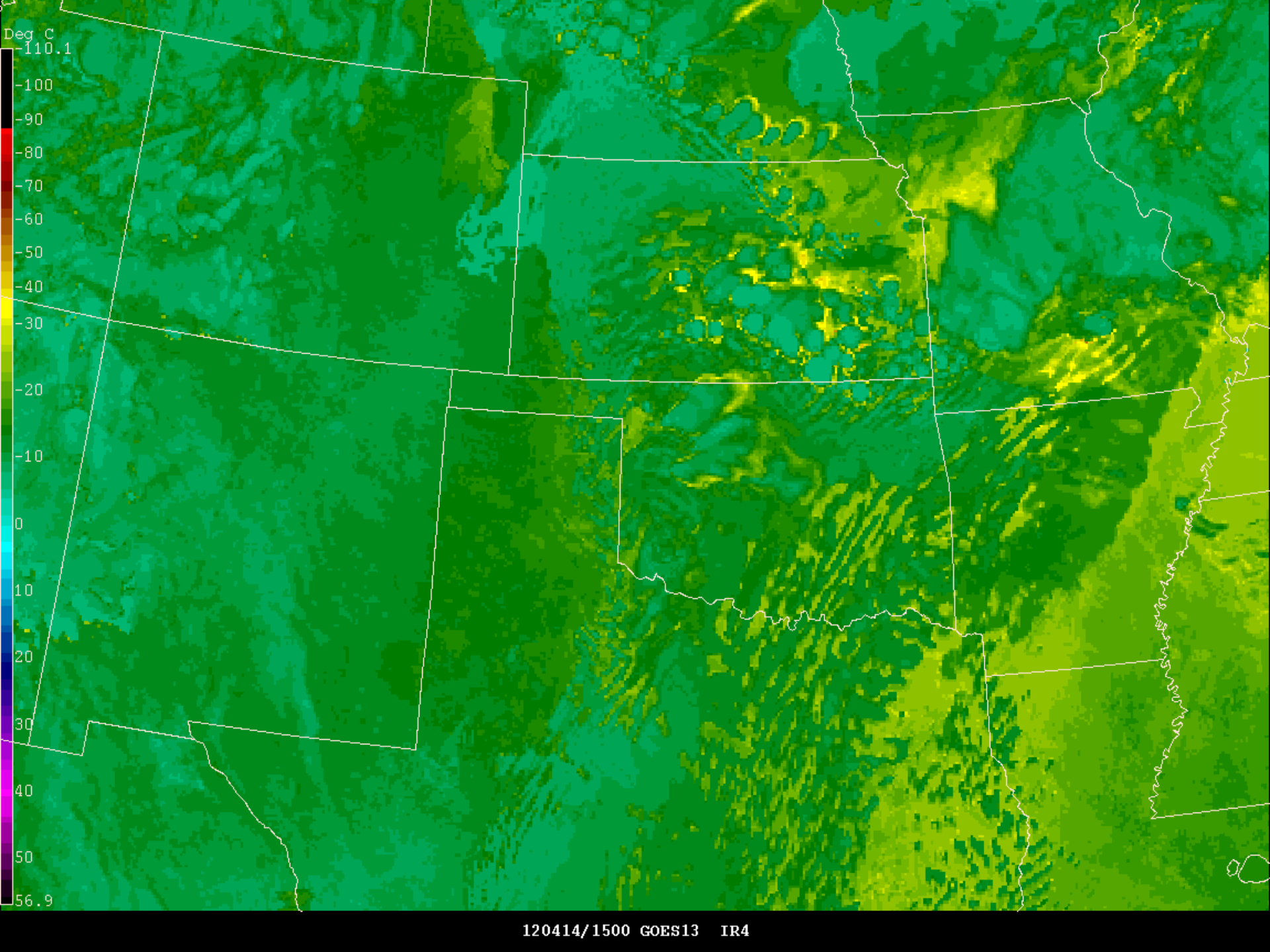
56.9
110524/1200 GOES13 IR4


Deg C
-110.1
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-10
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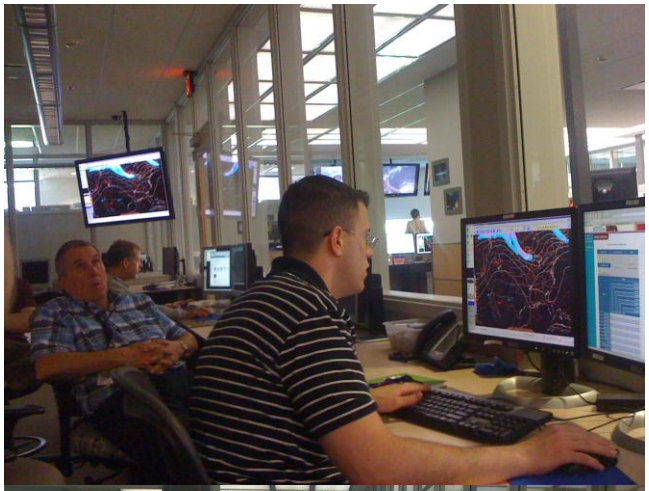
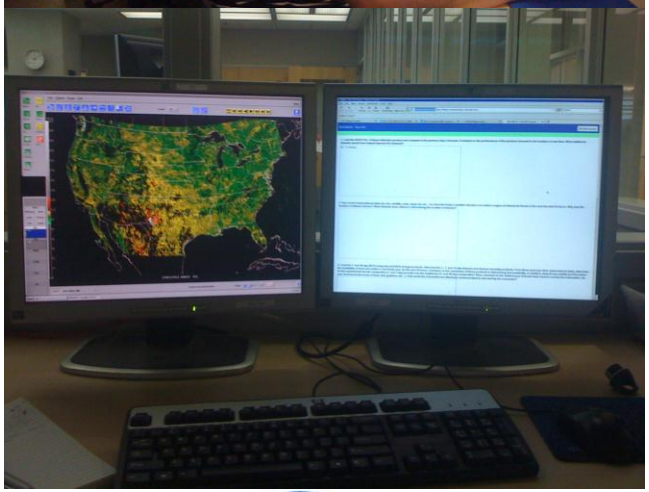
56.9
120414/1500 GOES13 IR4

2011 Fire Weather Experiment

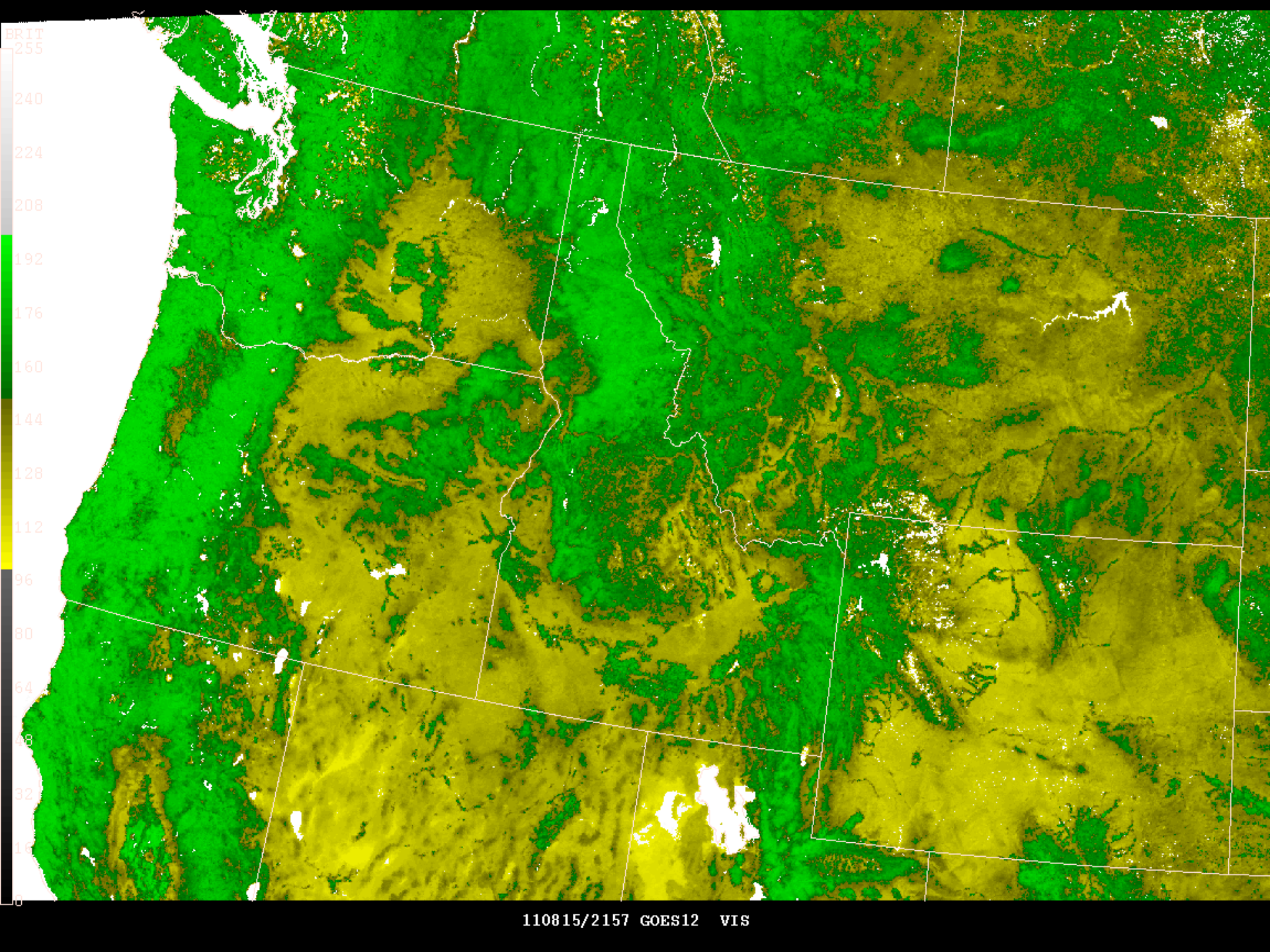
- 2-week period (22 Aug. – 2 Sept.)
  - During western US fire weather season
  - Main focus on burnable fuels and dry thunder forecasting
- 6 NWS forecasters and several internal guests participated
  - SPC and Norman WFO
- 6 Proving Ground products demonstrated
- Real-time fire weather forecasts using N-AWIPS
  - Forecast 24-hour burnable fuels and dry thunder threat





NDVI / NDVI Change

- NDVI = (NIR-VIS)/(NIR+VIS)
  - Relative index of green vegetation cover
  - Values range from 0-1
  - Clear sky only from MODIS imagery
    - Updates every 2 weeks
  - Can be compared to land use maps
- NDVI change calculated using last 2 NDVI composites
  - Identify regions of decreasing or increasing greenness
  - Updated monthly


BRIT
255
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144
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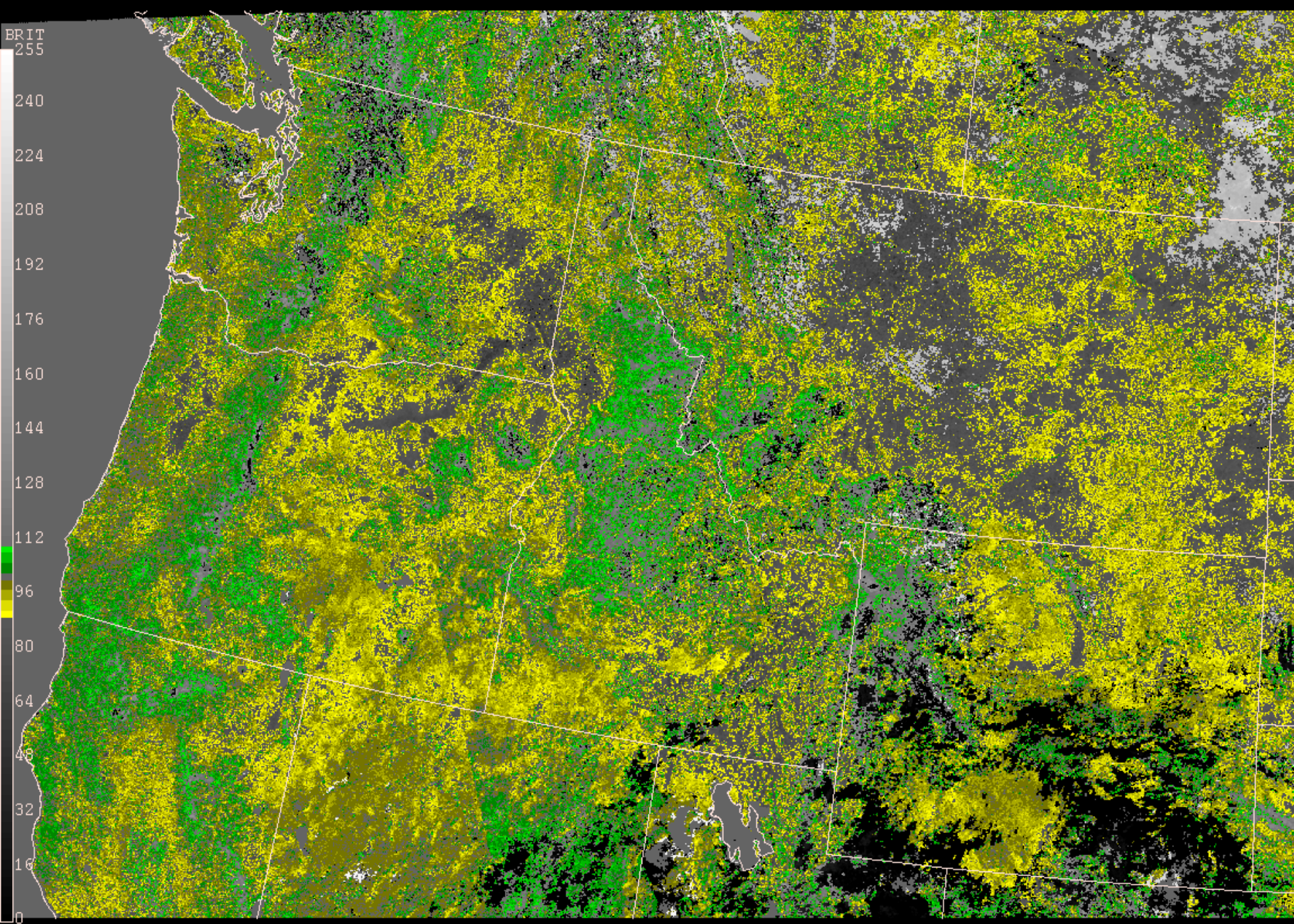
112
96
80
64
32
0
110815/2157 GOES12 VIS


BRIT
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16
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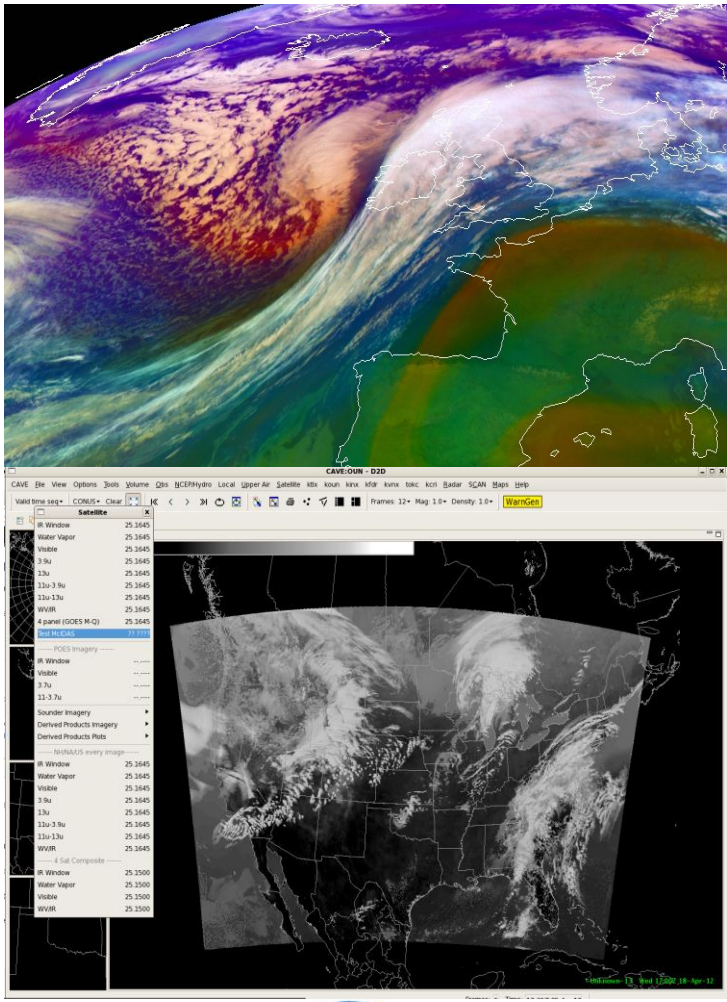
110815/2157 GOES12 VIS

2012 Spring Experiment

- 6-week period (7 May – 15 June)
  - During central plains peak severe weather season
  - Main focus on severe and CI
- 24 NWS forecasters and 15 visiting scientists invited
- 2 new Proving Ground products
  - Sounder Airmass RGB and probabilistic SATCAST
- Real-time forecast and warning exercises using operational decision support tools
  - N-AWIPS and AWIPS II
- Weather Event Simulator (WES) cases and jobsheets sent to forecasters pre-arrival



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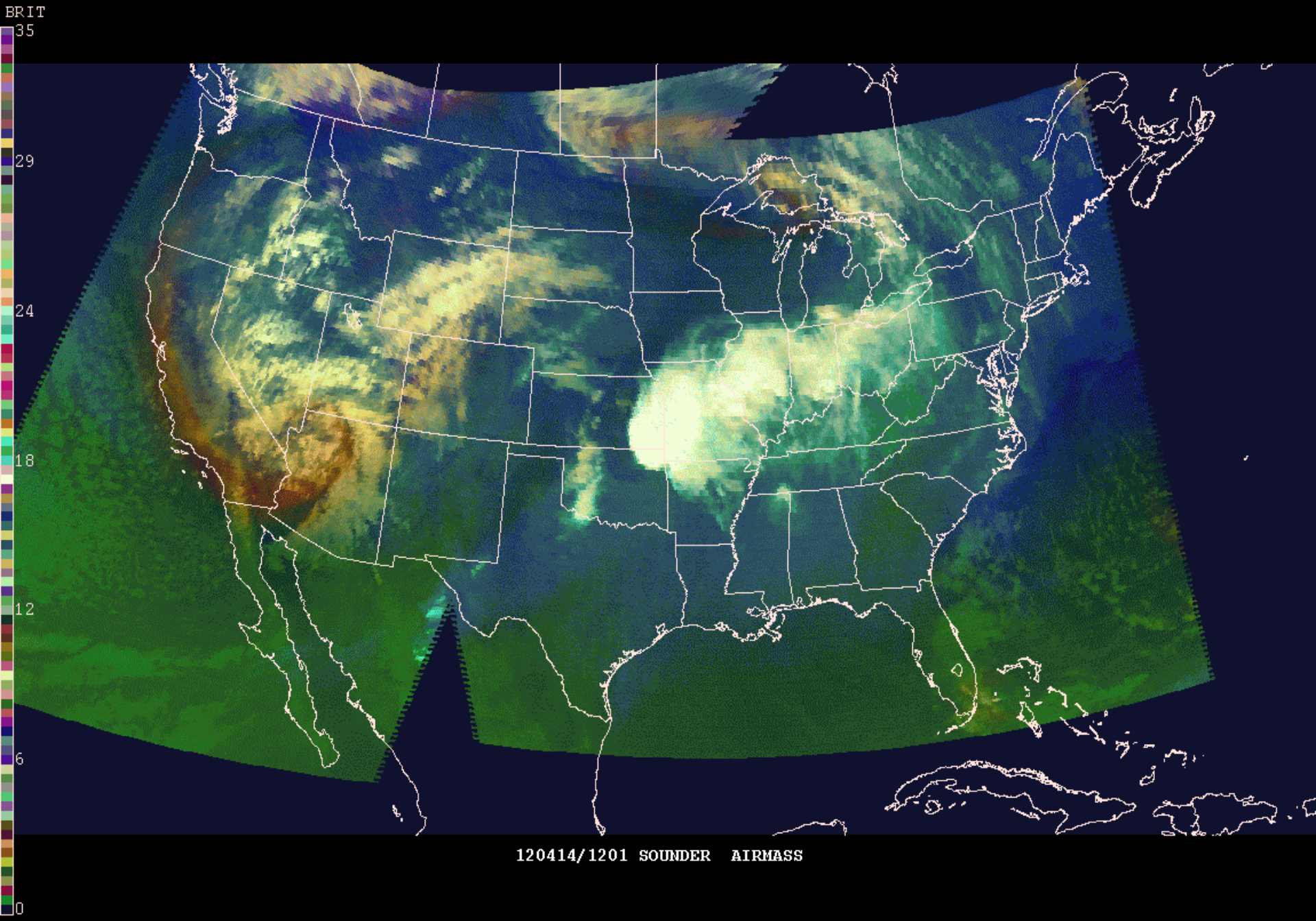
CONNECTING RESEARCH AND OPERATIONS GOES-R PROVING GROUND

NATIONAL SEVERE STORMS LABORATORY

Storm Prediction Center Norman, Oklahoma


BRIT
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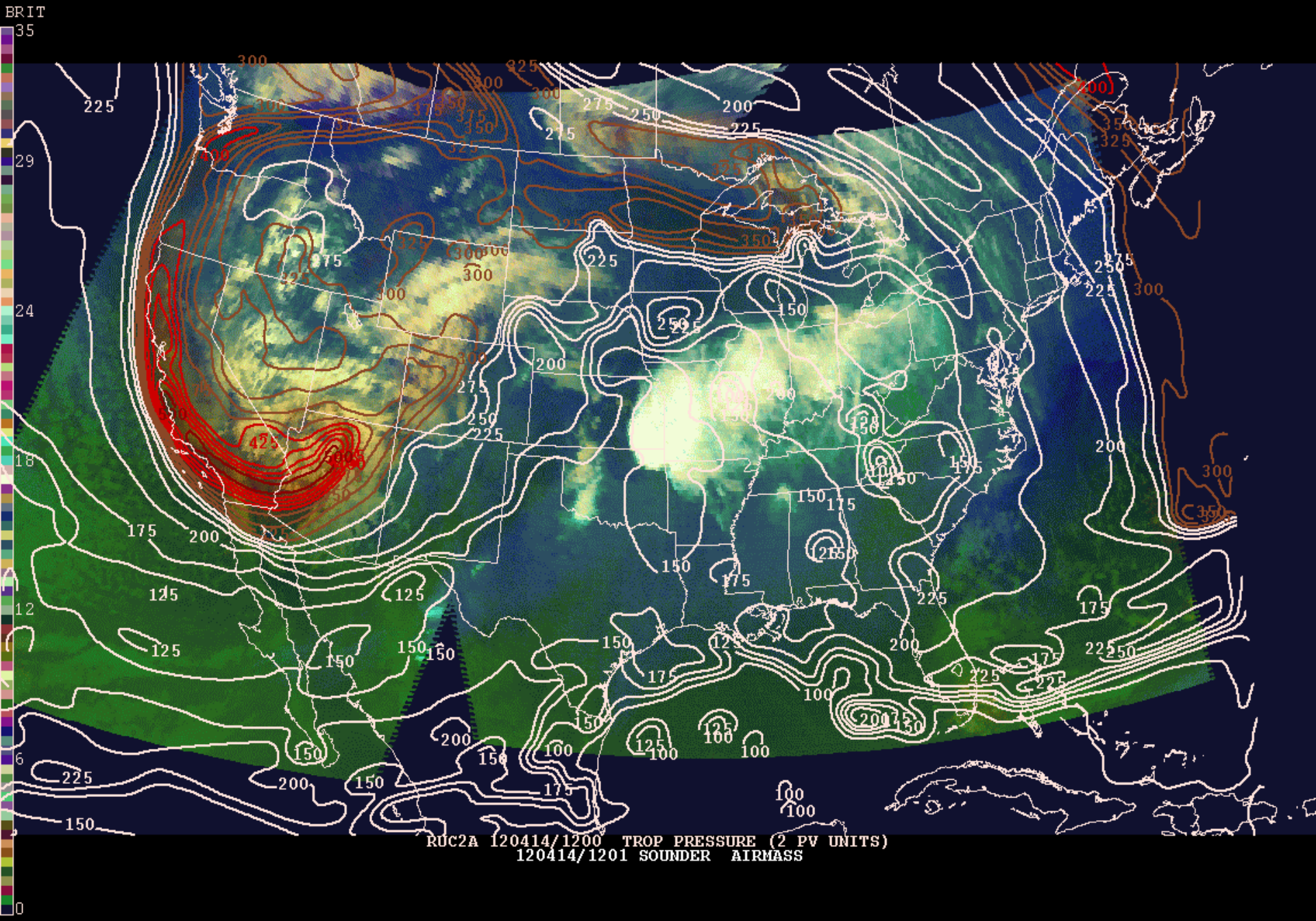
120414/1201 SOUNDER AIRMASS


BRIT
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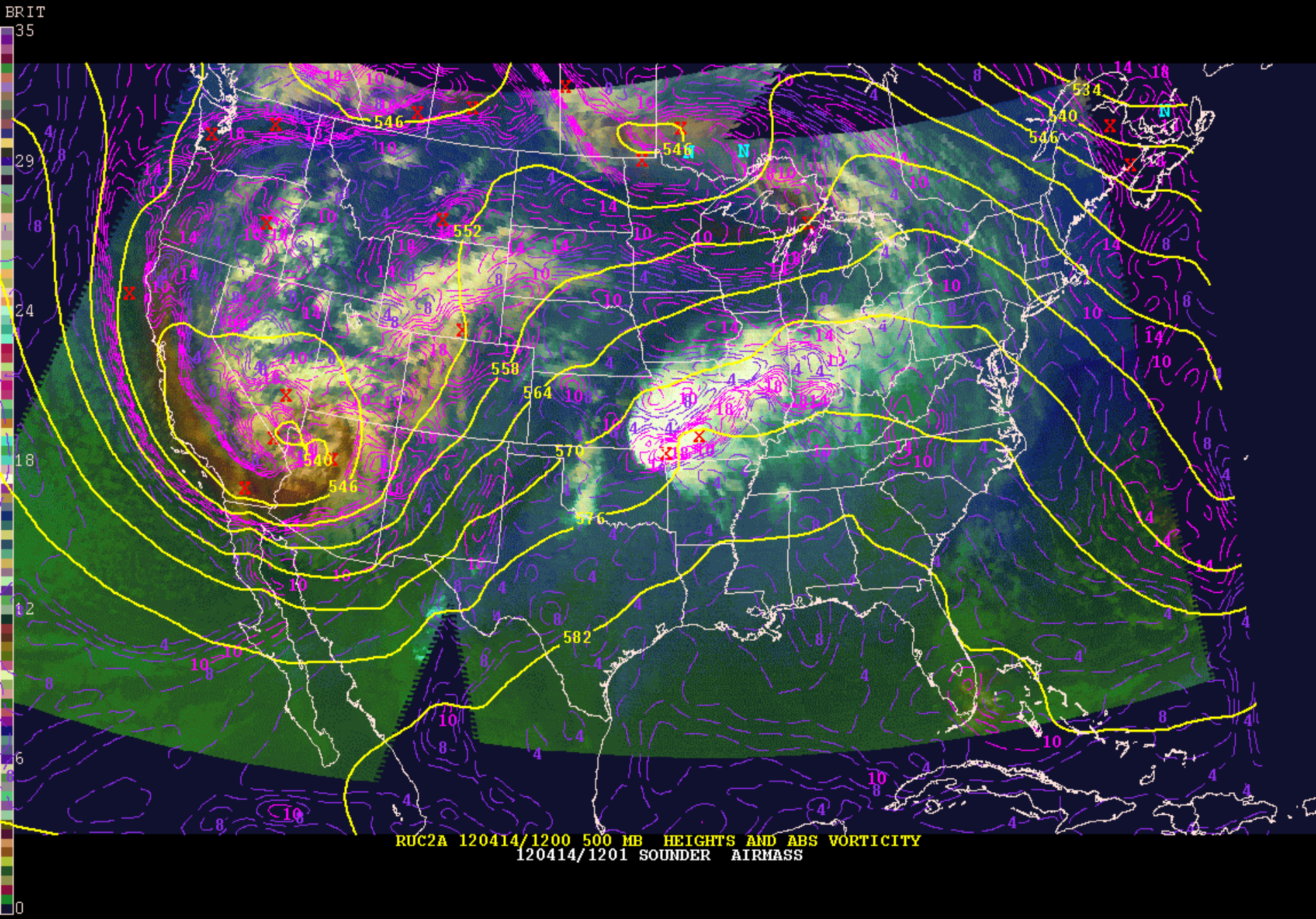
RUC2A 120414/1200 TROP PRESSURE (2 PV UNITS)
120414/1201 SOUNDER AIRMASS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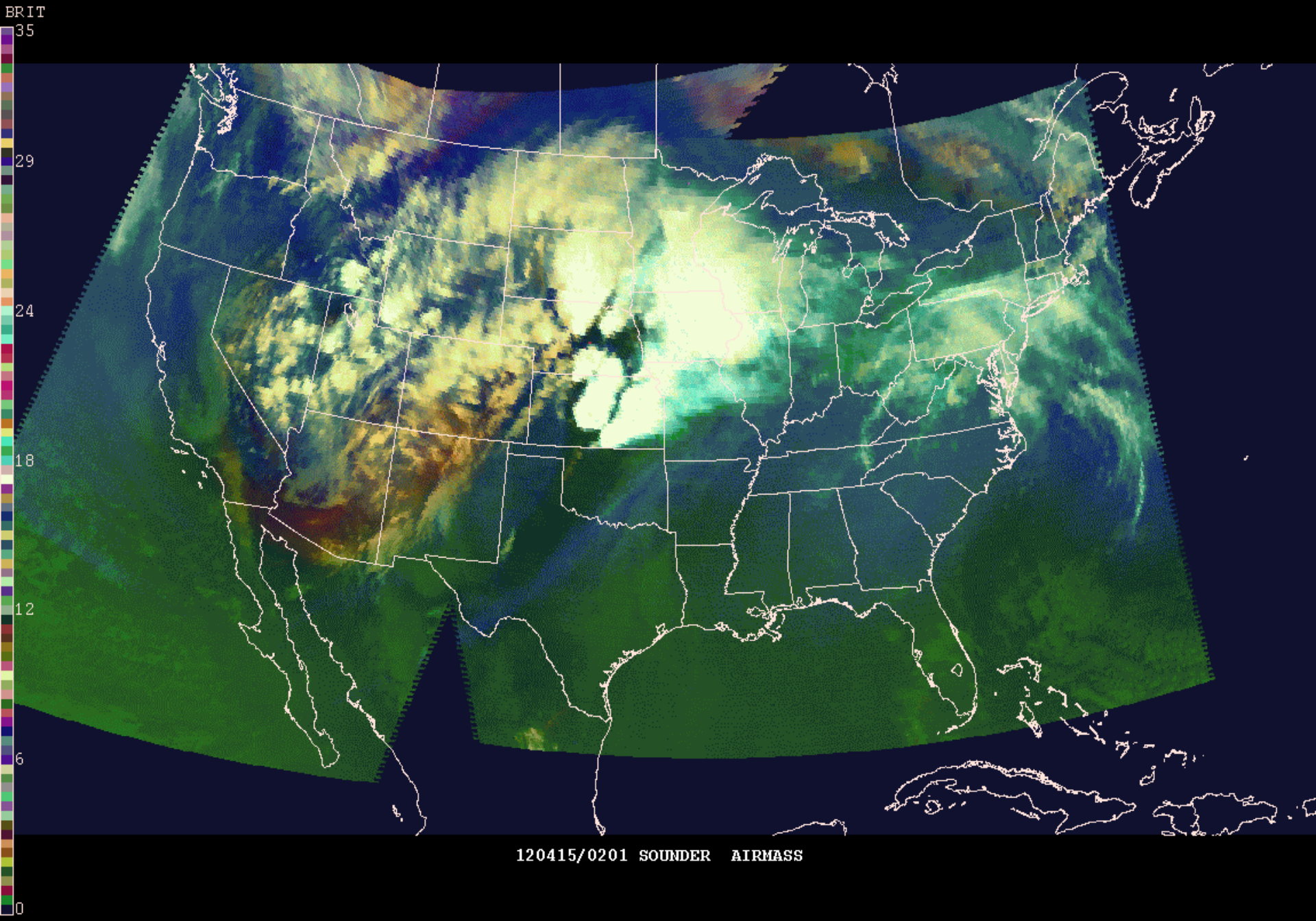
RUC2A 120414/1200 500 MB HEIGHTS AND ABS VORTICITY
120414/1201 SOUNDER AIRMASS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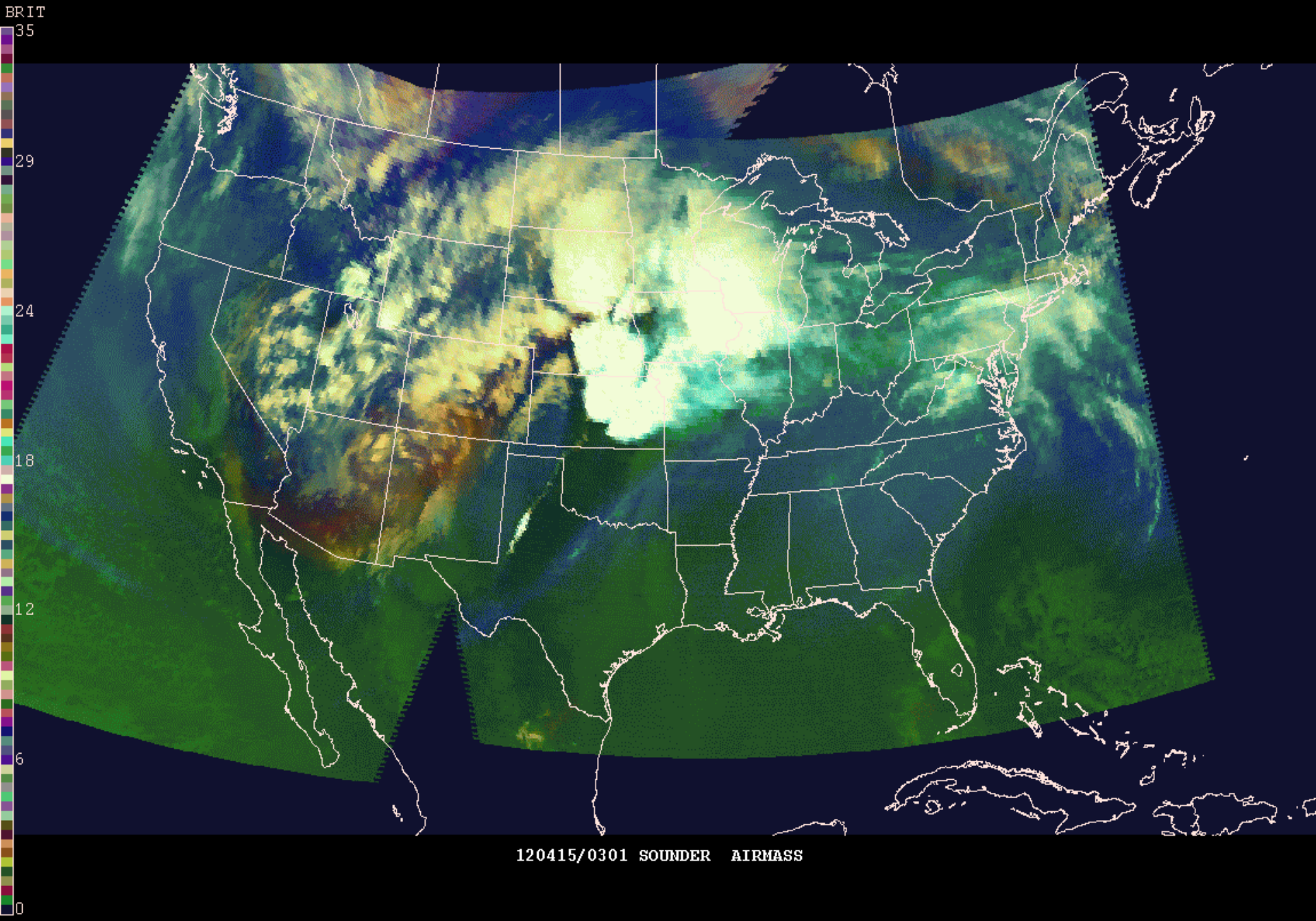
120415/0201 SOUNDER AIRMASS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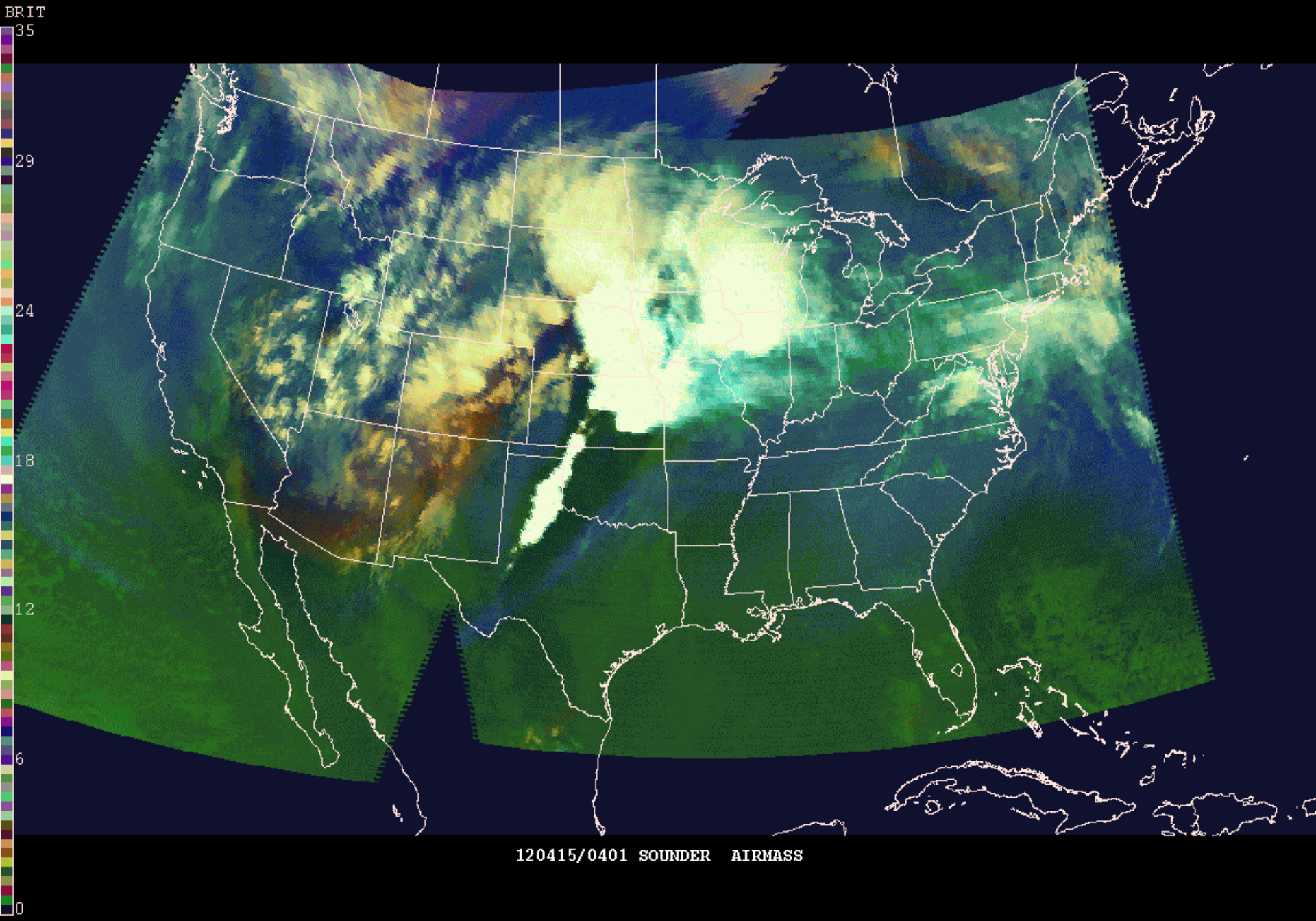
120415/0301 SOUNDER AIRMASS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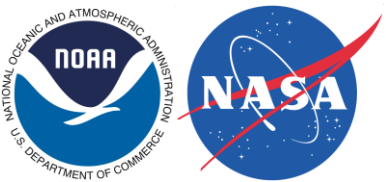
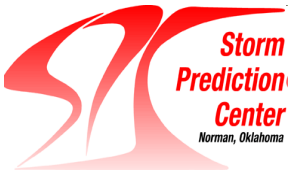
120415/0401 SOUNDER AIRMASS

Capturing Feedback

- Real-time blogging http://goesrhwt.blogspot.com/
  - During forecast/warning exercises
  - Participants are also encouraged to blog following forecast/warning exercises
- Web-based surveys
  - Immediately following forecast/warning operations
- Daily post-mortem discussions
  - Between visiting scientists and forecasters

Thank you for your attention!

Chris.Siewert@noaa.gov

http://goesrhwt.blogspot.com