

Ad Hoc  
 Meteorological  
 Modeling Group  
 Meeting  
 June 14 -15, 2007

# NCEP Modeling Activities And Other Useful Information

Peter Manousos - Sr. Scientist, Environmental

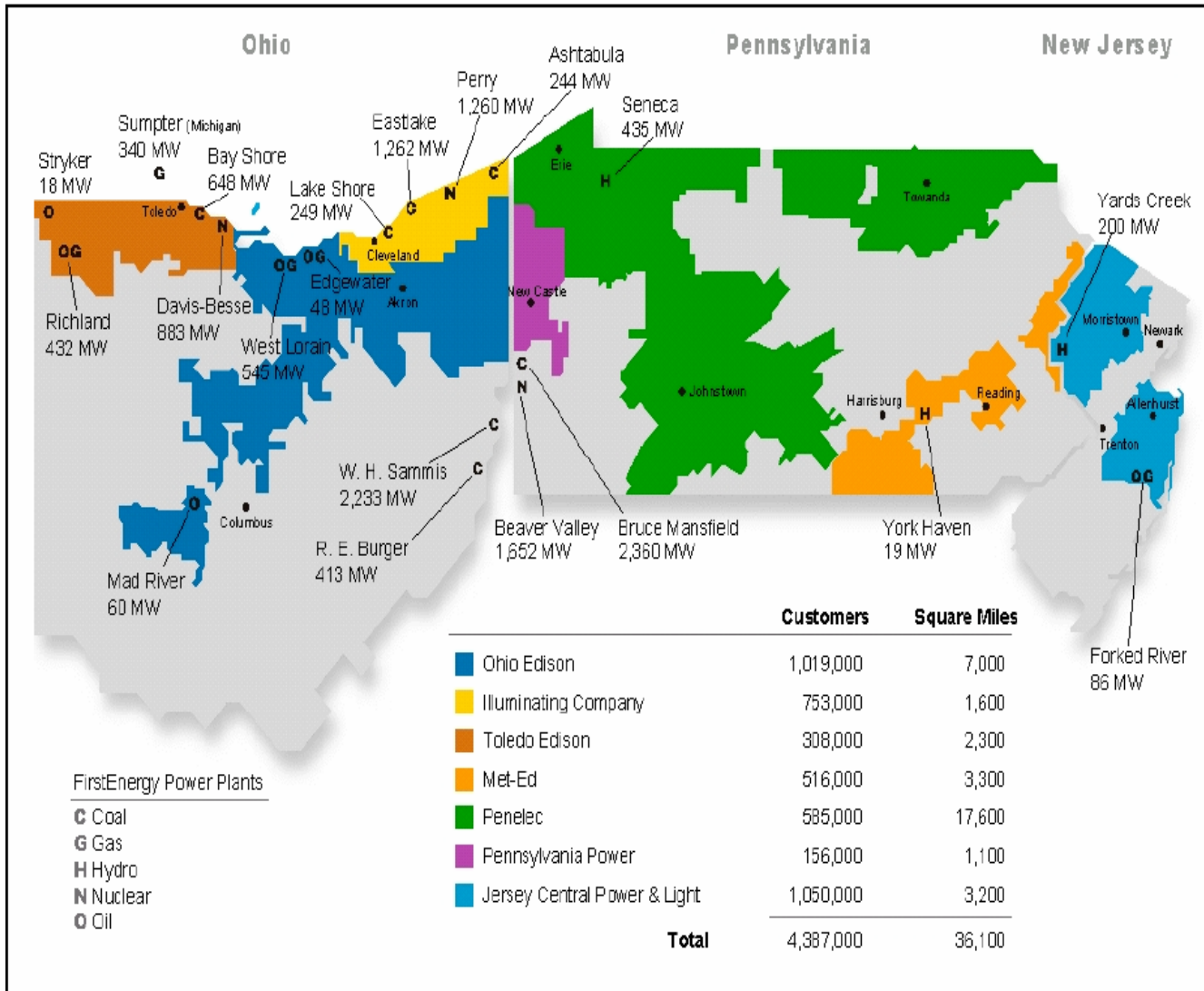


# Goals of Presentation

- Provide a short term road map for NCEP modeling activities
- Show Model “Gotchas”
- Provide Helpful Info related to questions/issues raised on Day 1
- Answer questions



# FirstEnergy Service Area and Vision



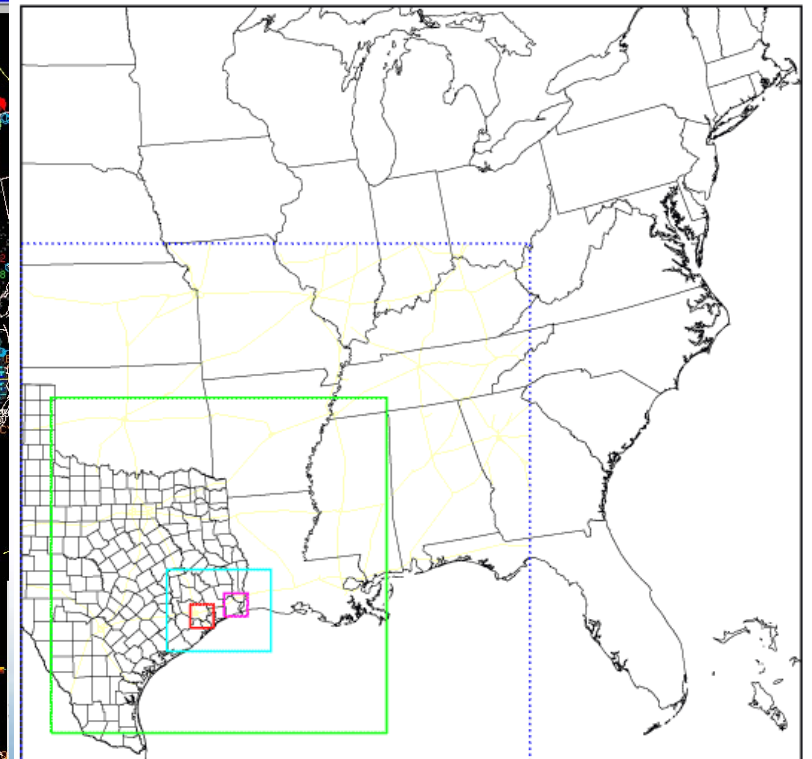
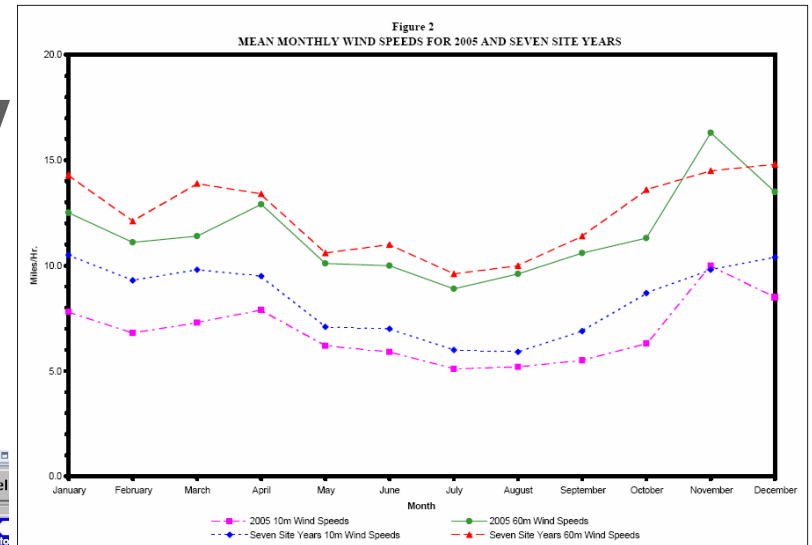
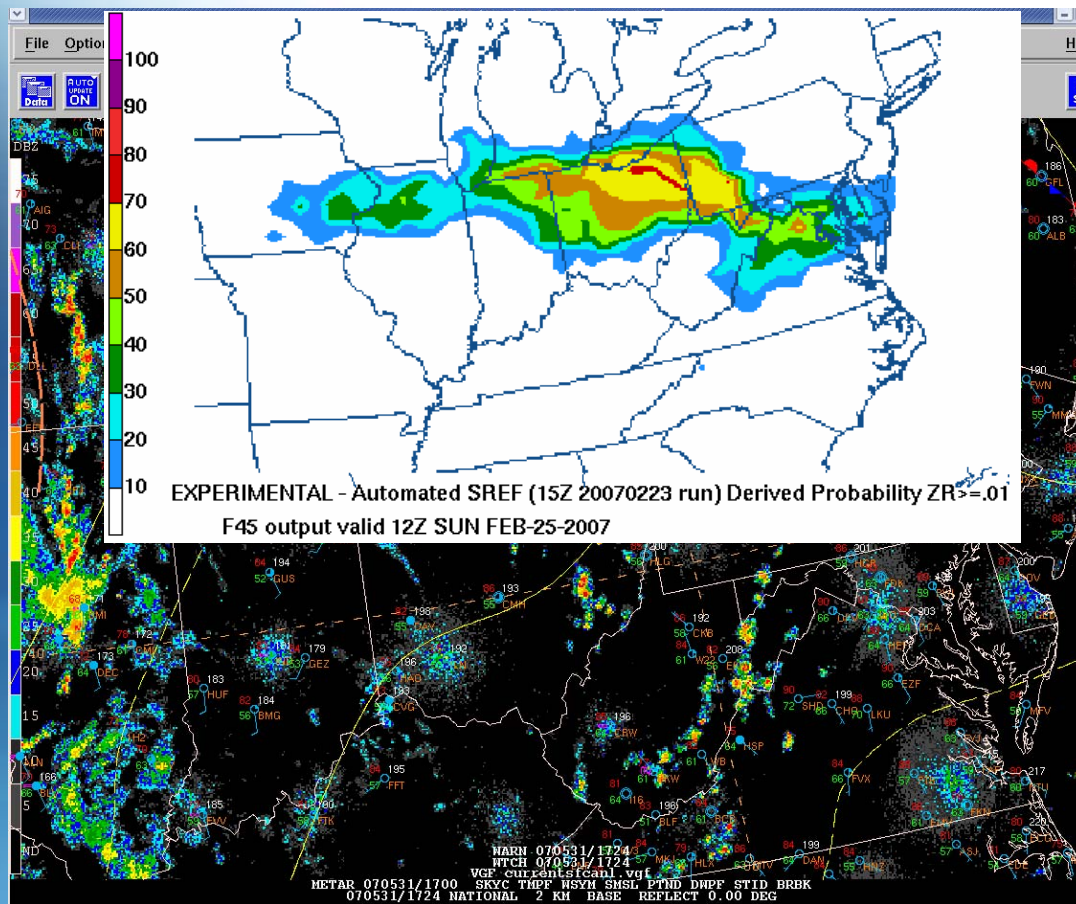
## OUR STRATEGIC VISION

FirstEnergy will be a leading regional energy provider, recognized for operational excellence, customer service and its commitment to safety; the choice for long-term growth, investment value and financial strength; and a company driven by the leadership, skills, diversity and character of its employees.

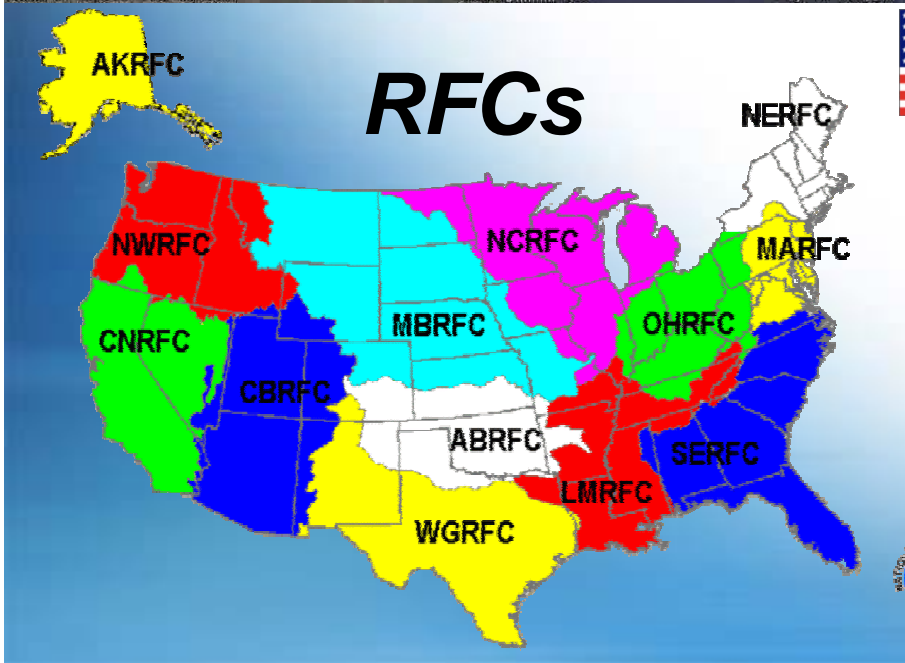
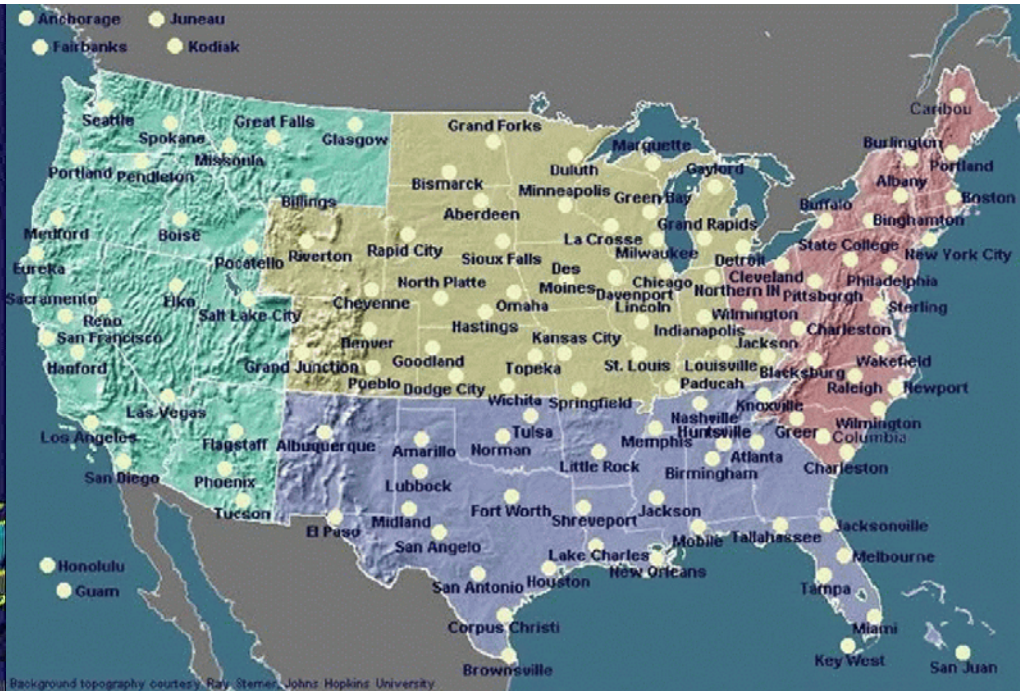


# Meteorology at FirstEnergy

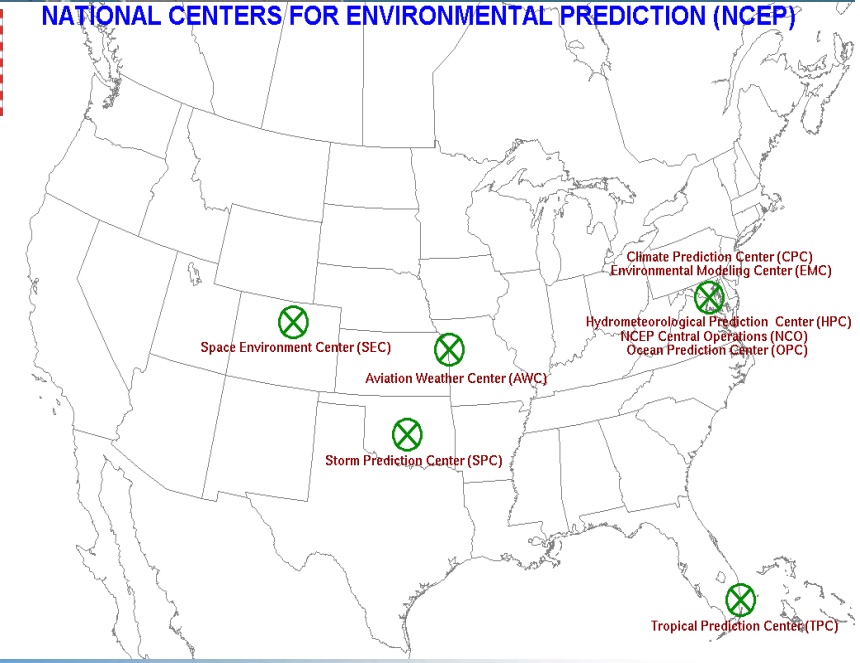
- Climatology
- Regulatory Modeling
- Forecasting (threat assessment)



# *Model Info*



**NATIONAL CENTERS FOR ENVIRONMENTAL PREDICTION (NCEP)**



# NOAA NWS NCEP HPC PRODUCTS AND SERVICES

<http://www.hpc.ncep.noaa.gov>

## ■ Precipitation Forecasts

- 5 Day
- Excessive Rainfall
- Probabilistic Snow/Ice
- National Flood Outlook

## ■ Fronts/pressures

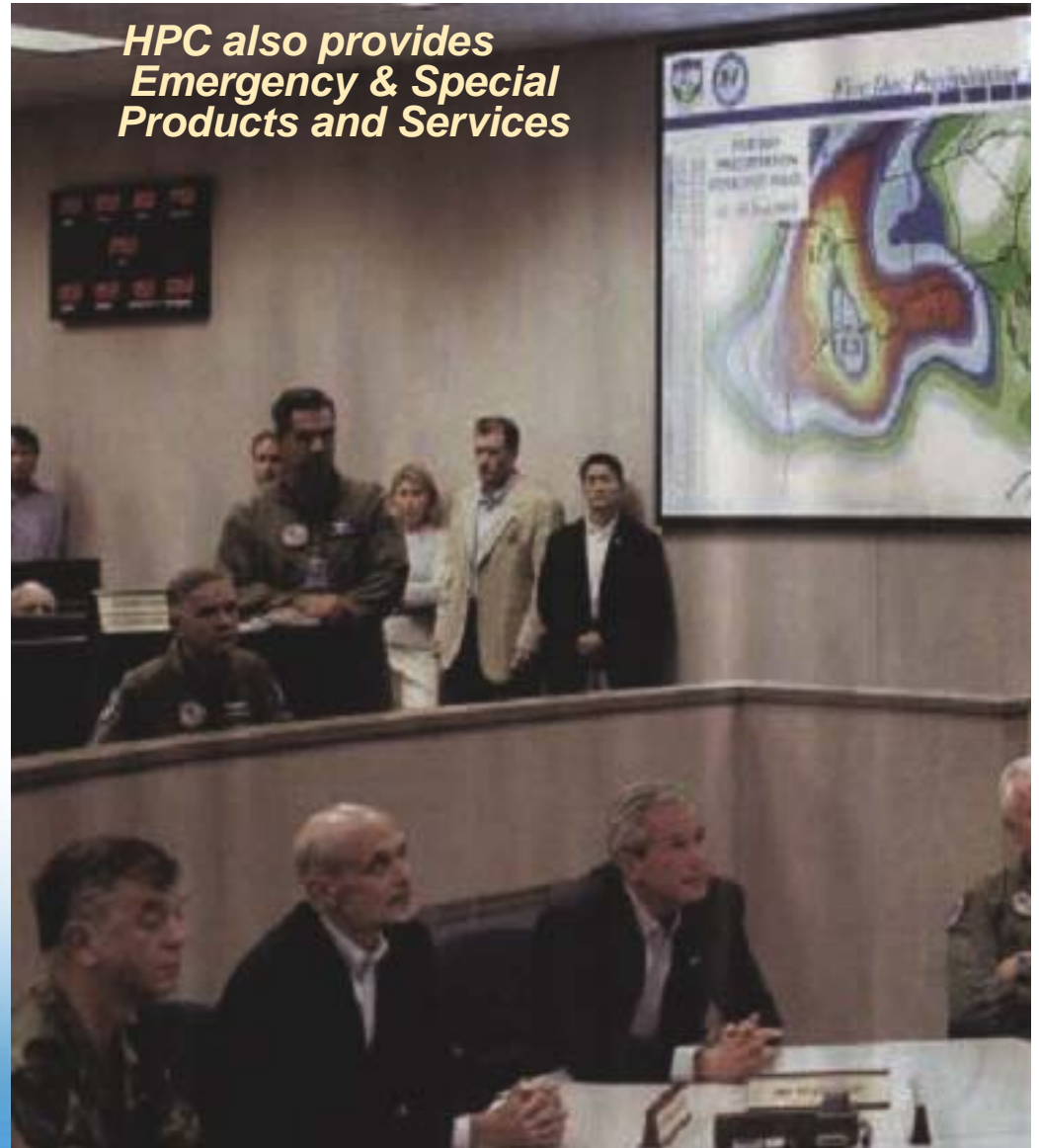
- Surface Analysis
- 12 hour to Day 7 Forecasts
- General Weather through Day 2
- Temperature forecasts to Day 7
- Tropical guidance to Day 7

## ■ Model diagnostics

## ■ International Desk

## ■ Experimental products

*HPC also provides  
Emergency & Special  
Products and Services*





# MM5 - RIP

- MM5 was frozen 2005 (a few crisis patches have been implemented since)
- WRF ARW nudging capability implemented Dec 2006
- <http://wrf-model.org>

The screenshot shows the WRF Model Website in Microsoft Internet Explorer. The browser address bar displays <http://www.wrf-model.org/index.php>. The website header features the WRF logo and the text "THE WEATHER RESEARCH & FORECASTING MODEL". The navigation menu includes tabs for Home, Working Groups, User Resources, Projects, Events, and Real-time Forecasts. The main content area is titled "About the Weather Research & Forecasting Model" and contains several paragraphs of text, a map of the United States with a "CLICK TO SEE WRF FORECAST" button, and a list of "Upcoming Events" including the "Eighth WRF Users Workshop" and "2007 WRF Users Tutorial". There is also an "Announcements" section and a "Website Questions or Comments" link.

# NWS Modeling System - Short Term Road Map

## ■ CCS – Central Computing System

- System upgraded Jan 24 2007
  - “Mist” - operational system - Gaithersburg, MD
  - “Dew” - development system and hot spare - Fairmont, WV – 3x previous machine’s calculation capacity (White)
  - “Haze” – NOAA R & D system – Gaithersburg, MD -
- Mist and Dew are 3x previous machine’s calculation capacity (Blue and White respectively)
- 16 processors/node and 2Gb mem/processor (10% faster memory chips than on Blue and White)
- System specific upgrades (patches) are implemented on a quarterly basis

## ■ GFS – Global Forecast System

- T384/64L resolution, T190 after 180 hrs
- Recent upgrades on April 24 2007
  - GSI, New analysis data, Vertical coordinate change from sigma to sigma-P
- Upcoming changes
  - Imminent - unified post
  - Upcoming by FY07 4Q - RH calc consistent with NAM, trop height, upgrade to add codes for GOES 1x1 field of view data, METOP, etc.
  - No planned increases in resolution this FY

## ■ NAM – North American Mesoscale Model

- WRF core run at 12km/60L res, non hydrostatic, sigma/p coordinate system
- No short term planned increases to model res
- Recently
  - 18% increase in domain expansion to N, W, and E
  - Coding improvements to make up for increase in domain size
  - Ability to ingest new ob types (MODIS, AIRS),
  - Physics tweaks (increased divergence damping during NAM data assimilation, and GSI constraints for better balance fields)
- RTMA – available hourly at H+45, aiming for H+35 (Surface T, W, Q, Cloud amount at 5km over CONUS)

## ■ GEFS – Global Ensemble Forecast System

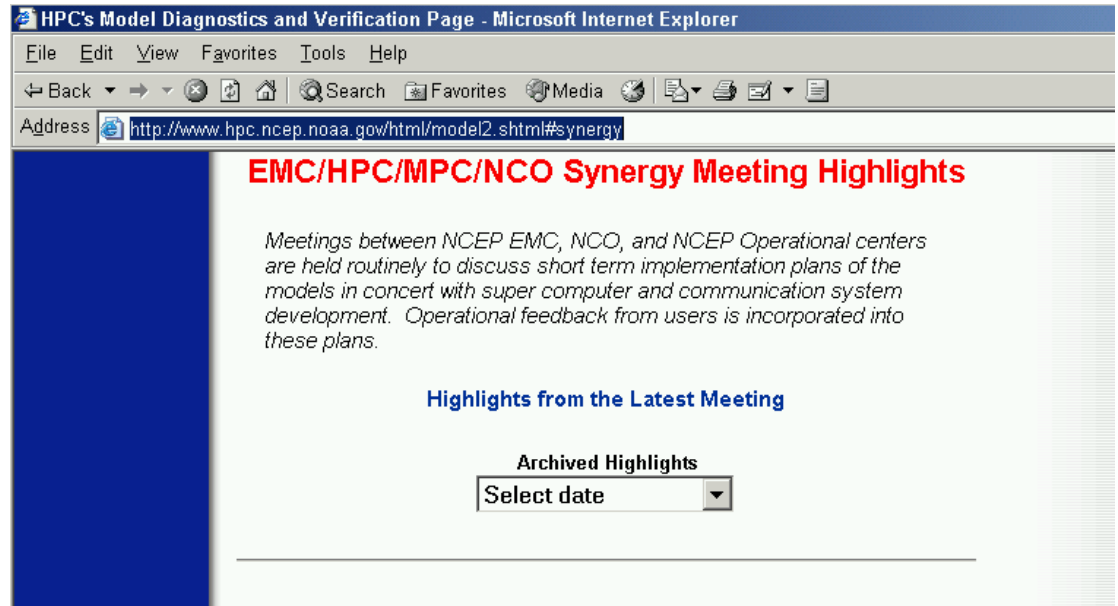
- 14 members run at T126/L64 4x/day
- NAEFS CMC members increasing from 16 to 20 members.. + 20 GEFS = 40 members per cycle

## ■ SREF – Short Range Ensemble Forecast System

- 21 members run at approx 34km horiz res 4 cycles per day (posted to 40km grib files) - **10 Eta members, 5 RSM, 6 WRF**
- Intention to convert all members to WRF NMM core by Q1 FY 2008 (after hurricane season).. with all members run at 32km res

# Monthly Synergy Meetings

- **Informal meeting with**
  - EMC, NCO, MMB, NCEP Service Centers, WFOs
- **Near term model development and super computer/comm systems plans provided**
- **Users can anticipate and accommodate changes**
- **Highlights posted to web**



<http://www.hpc.ncep.noaa.gov/html/model2.shtml#synergy>

# Daily Model Diagnostic Discussion

<http://www.hpc.ncep.noaa.gov/discussions/pmdhmd.html>

## MODEL DIAGNOSTIC DISCUSSION

NWS HYDROMETEOROLOGICAL PREDICTION CENTER CAMP SPRINGS MD  
130 PM EDT THU MAY 31 2007

VALID MAY 31/1200 UTC THRU JUN 04/0000 UTC

MODEL INITIALIZATION...

...SEE NOUS42 KWNO ADMNFD FOR STATUS OF UPPER AIR INGEST...

ANY INITIALIZATION ERRORS ON THE 12Z NAM APPEAR TO BE MINOR AND DO NOT SEEM TO SIGNIFICANTLY INFLUENCE ITS FORECAST.

...SYSTEM FCST TO CROSS THE ERN GULF OF MEXICO/FL...

THE GFS APPEARS TO HAVE INITIALIZED THE BROAD SFC LOW OVER THE NWRN CARIBBEAN SEA ABOUT 50 TO 70 NM TOO FAR TO THE SOUTHEAST OF THE APPARENT 12Z PSN.

MODEL TRENDS...

...SHRTWV INITIALLY OVER SRN CA...

THE NEW NAM HAS TRENDED SLIGHTLY STRONGER WITH THIS ENERGY EJECTING ESE ACRS THE DESERT SW FOR THE FIRST 12 TO 24 HRS BEFORE THEN SHEARING OUT ACRS THE SRN PLAINS. THERE IS NO DISCERNIBLE SFC REFLECTION ASSOC WITH THIS. THE NEW GFS SHOWS VRY GOOD RUN TO RUN CONTINUITY WITH THE SYS.

...SHRTWV REACHING CA LATE SAT...

THE LATEST NAM HAS TRENDED SOMEWHAT WEAKER ALOFT WITH THIS ENERGY COMPARED TO ITS 00Z RUN ALTHOUGH THE SFC REFLECTION IS ESSENTIALLY UNCHANGED. COMPARED TO 24 HRS AGO THE ENERGY GAS TRENDED NOTABLY MORE PROGRESSIVE. THE GFS SHOWS VRY GOOD RUN TO RUN CONTINUITY WITH THE SYS.

...NRN PLAINS CLOSED LOW DRIFTING INTO THE UPR MS VALLEY...

THE NEW NAM SHOWS VRY GOOD CONTINUITY AT 500 MB ALL THE WAY OUT TO 84 HRS IN COMPARISON TO THE 00Z RUN. THIS IS GENERALLY THE CASE AT THE SFC TOO...ALTHOUGH THE NAM SUGGESTS HOLDING THE MAIN SFC LOW OVER THE DAKOTAS BACK TO THE WEST FOR A BIT LONGER ON DAY 1 BEFORE PUSHING IT TWD THE MIDWEST THEREAFTER. HOWEVER...COMPARED TO 24 HRS AGO...THE NAM HAS TRENDED CONSIDERABLY SLOWER REGARDING THE FULL VERTICAL DEPTH OF THE LOW. THE NEW GFS DOES SHOW A TREND TWD BEING A LITTLE MORE PROGRESSIVE AS COMPARED TO THE 00Z RUN...WITH THE UPR LOW AND SFC REFLECTION BOTH EJECTING FASTER OFF TO THE ENE AFTER 24 HRS THRU THE MIDWEST AND INTO THE WRN CRT LAKES REGION BY 84 HRS.

...SYSTEM FCST TO CROSS THE ERN GULF OF MEXICO/FL...

THE NAM HAS TRENDED CONSIDERABLY FASTER IN BRINGING A SFC LOW INVOF THE YUCATAN PENINSULA NWD THRU THE ERN GULF OF MEXICO FRM 24 TO 60 HRS ALONG WITH AN UPR TROF/CLSD LOW OVER THE W CTRL GULF OF MEXICO THAT IS INTERACTING WITH IT. THEREAFTER THE SYS EJECTS INTO THE SRN APPALACHIANS. THE NEW GFS CONTINUES TO SHOW DIFFICULTY RUN TO RUN REGARDING THE TRACK AND SPEED OF THE SFC LOW. THE GFS IS FASTER WITH THE NEWD MOVEMENT OF THE SFC LOW ACRS THE S CTRL FL PENINSULA AND INTO THE W ATLC UP THRU ABOUT 72 HRS. THEREAFTER IT HAS TRENDED SLOWER AND CLOSER TO THE EAST COAST VS THE 00Z RUN.

...FRONT INITIALLY PROGRESSING INTO NEW ENGLAND...

VRY LITTLE CHANGE IN CONTINUITY IS NOTED ON BOTH THE NAM AND GFS WITH REGARD TO THE CURRENT FRONT DRAPED ACRS NEW ENGLAND WHICH IS EXPECTED TO RETURN NWD ON DAY 1 AS A WRN FRONT.

...FRONT ENTERING NEW ENGLAND BY EARLY SAT...

THE NAM SHOWS LITTLE OVERALL DIFF WITH THE TIMING OF THIS FEATURE BUT HAS TRENDED TWD A SOMEWHAT STRONGER SFC WAVE DEVELOPING ALONG THE FRONT BY 48 HRS AND AFFECTING MAINLY CTRL NEW ENGLAND. THE GFS SHOWS THE SAME THEME...ALTHOUGH IT HAS TRENDED TWD THE IDEA OF MULTIPLE SFC WAVE MOVING ALONG THE BNDRY INSTEAD OF JUST ONE SFC WAVE WHICH THE 00Z RUN HAD ADVERTISED.

MODEL DIFFERENCES AND PREFERENCES...

...SHRTWV INITIALLY OVER SRN CA...

THE 12Z NAM AND GFS SHOW LITTLE OVERALL DIFF IN HOW THIS ENERGY MOVES ACRS THE DESERT SW ON DAY 1 AND THE EXPECTATION OF THIS ENERGY SHEARING OUT OVER THE SRN PLAINS THEREAFTER IN RESPONSE TO THE DEEP CLSD LOW OVER THE NRN PLAINS. HENCE WUD PREFER A NAM/GFS BLEND ATTM.

...SHRTWV REACHING CA LATE SAT...

THE 12Z NAM AND GFS AGREE IN BRINGING THIS ENERGY TWD THE SRN CA COAST BETWEEN 48 AND 60 HRS...BUT THEN ESSENTIALLY SHEAR THE ENERGY OUT TO THE NORTHEAST THEREAFTER. THE 09Z SREF MEAN SHOWS LITTLE DEVIATION IN THE TIMING AND HANDLING OF THIS ENERGY COMPARED TO THE NAM/GFS CAMP...BUT THE 00Z ECMWF AND ESP THE 12Z UKMET INDICATE THE POSSIBILITY THAT SOME OF THIS ENERGY MAY ATTEMPT TO UNDERCUT DEEP LYR MEAN RIDGE OVER THE INTERMOUNTAIN REGION. THE CONSENSUS IS FOR MUCH THIS ENERGY TO BE EJECTED NEWD AND SHEARED APART AHEAD OF STG HEIGHT FALLS APPROACHING THE W COAST.

...NRN PLAINS CLOSED LOW DRIFTING INTO THE UPR MS VALLEY...

THE 12Z GFS HAS TRENDED A BIT MORE PROGRESSIVE WITH THE CLSD LOW AND ASSOC SFC LOW/FRONT MOVING OUT OF THE PLAINS AND INTO THE MS VLY AND WRN CRT LAKES REGION. THIS IS TREND TWD THE MORE PROGRESSIVE CAMP OF THE 00Z ECMWF AND 12Z UKMET. THE 12Z GEM GLOB IS A TAD SLOWER...WITH THE 12Z NAM AN OUTLIER IN BEING THE SLOWEST. PREFER THE GFS-LED CONSENSUS WITH THIS SYS.

...SYSTEM FCST TO CROSS THE ERN GULF OF MEXICO/FL...

SIGNIFICANT DISAGREEMENT CONTINUES AMONGST THE 12Z GUIDANCE IN HOW TO HANDLE THE DEVELOPING SFC LOW ATTM OVER THE NWRN CARIBBEAN SEA. THE 12Z NAM CONTINUES TO BE A FAR WEST OUTLIER...IN TAKING THE SFC LOW TWD THE FL PANHANDLE AT 60 HRS. THE GFS ON THE OTHERHAND IS SIGNIFICANTLY TO THE RIGHT AND TAKES THE SYS ACRS THE S CTRL FL PENINSULA AND ALSO AT A MUCH MORE RAPID SPEED. SOME OF THIS IS RELATED TO THE GFS BREAKING DOWN THE SUBTROPICAL RIDGE OVER THE SOUTHEAST U.S. QUICKER. IN ANY CASE THOUGH...THE GFS TRACK IS PROBLEMATIC AT BEST DUE TO SOME SERIOUS CONVECTIVE FEEDBACK CONTAMINATION AND WILL BE DISREGARDED. THE 00Z ECMWF AND 12Z GEM GLOB ARE ACTUALLY MORE CONSISTENT AND SHOW A MORE REASONABLE TRACK THAT TAKES THE SYS OFF THE YUCATAN PENINSULA BY 36 HRS AND INTO THE CTRL OR N CTRL FL PENINSULA BETWEEN 48 AND 60 HRS. THIS ALSO ALLOWS FOR THE SUBTROPICAL RIDGE TO ONLY GRADUALLY ERODE OFF THE SOUTHEAST COAST WHICH IS PREFERRED ATTM. THE 12Z UKMET SHOWS A SLOWER MOTION THAN ANY MDL UP TO 48 HRS WITH THE LOW SLOWLY ADVANCING THRU THE SERN GULF OF MEXICO...BUT THEN IT REFORMS THE SFC LOW OFF THE E COAST OF FL BY 72 HRS AND ACCELERATES THE SYS OUT TO SEA. HPC PREFERS A NON-NCEP CONSENSUS OF THE 00Z ECMWF AND 12Z GEM GLOB.

...FRONT INITIALLY PROGRESSING INTO NEW ENGLAND...

GENERALLY VRY GOOD AGREEMENT IS SEEN BETWEEN THE 12Z NAM/GFS SOLNS AND THE 00Z ECMWF REGARDING THE INITIAL FRONTAL PLACEMENT ACRS NEW ENGLAND AND THE IDEA THAT IT WILL ADVANCE NWD AS A WRN FRONT ON THROUGH 24 TO 36 HOURS. A NAM/GFS COMPROMISE WILL SUFFICE.

...FRONT ENTERING NEW ENGLAND BY EARLY SAT...

THE 12Z NAM AND 12Z GEM GLOB INDICATE THE FRONT ADVANCING SEWD INTO NEW ENGLAND WILL BE A LITTLE MORE PROGRESSIVE VS THE 12Z GFS AND 12Z UKMET SOLNS WHICH ARE A TAD SLOWER. THE SLOWER CAMP SEEMS TO BE RELATED TO THE IDEA OF PERHAPS MORE THAN ONE SFC WAVE EJECTING ALONG THE BNDRY...WHICH WOULD HELP TO SLOW THE SWD ADVANCE. ESSENTIALLY WUD PREFER TO BLEND THE TWO CAMPS ATTM AND SUGGEST A NAM/GFS BLEND.

ORRISON

MODEL BIASES AT WWW.HPC.NCEP.NOAA.GOV

*Daily WRF assessment from an operational perspective*



Ad Hoc Met Meeting • June 14 – 15, 2007

# Model Verification

Includes NAM (WRF) Verification

NOAA NWS NCEP HPC MODEL DIAGNOSTIC - INTERACTIVE MODEL BIAS PAGE - Microsoft Internet Explorer provided by FirstEnergy Corp.

Address: <http://www.hpc.ncep.noaa.gov/mdlbias/>

Zoom Refresh

Verif of prev 5 072h PMSL gfs fcsts 00z cycles only  
Posted to Web by: 11-11-11  
Mean Bias shaded (mbi) & Mean 00h Analysis contoured (mbi)

-20 -16 -12 -8 -4 0 4 8 12 16 20

**1. FORMAT SELECTIONS**

Output Format

- Individual Frame
- Loop Through Time
- Loop Through Height
- Loop Through Model

Info and Help

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*STATUS WINDOW*

The following applies for the GFS model

*(No limitations for given selections)*

**2. STILL FRAME SELECTIONS**

<p><b>Output Type</b></p> <p><input checked="" type="radio"/> Bias Raw</p> <p><input type="radio"/> Removed</p>	<p><b>Global Display Area</b></p> <p><input type="radio"/> NW <input type="radio"/> NE</p> <p><input type="radio"/> SW <input type="radio"/> SE</p>	<p><b>Model</b></p> <p><input checked="" type="radio"/> CMC <input checked="" type="radio"/> GFS</p> <p><input type="radio"/> ECMWF <input type="radio"/> NOGAPS</p> <p><input type="radio"/> NAM <input type="radio"/> UKMET</p>	<p><b>Forecast Hour</b></p> <p><input checked="" type="radio"/> F024 <input type="radio"/> F120</p> <p><input type="radio"/> F048 <input type="radio"/> F144</p> <p><input checked="" type="radio"/> F072 <input type="radio"/> F168</p> <p><input type="radio"/> F096</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Parameter</th> <th>250 mb</th> <th>500 mb</th> <th>700 mb</th> <th>850 mb</th> <th>1000mb</th> </tr> </thead> <tbody> <tr> <td>Height</td> <td><input checked="" type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td>Temp</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td>Relh</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td>Wind</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td>Other</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td>Surface</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td>1000-500Thk</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td>PW</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> </tbody> </table>	Parameter	250 mb	500 mb	700 mb	850 mb	1000mb	Height	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Temp	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Relh	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Wind	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Surface	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	1000-500Thk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	PW	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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**Output Type**

Bias Raw

Removed

**Cycle**

00z  12z

**Stats Window**

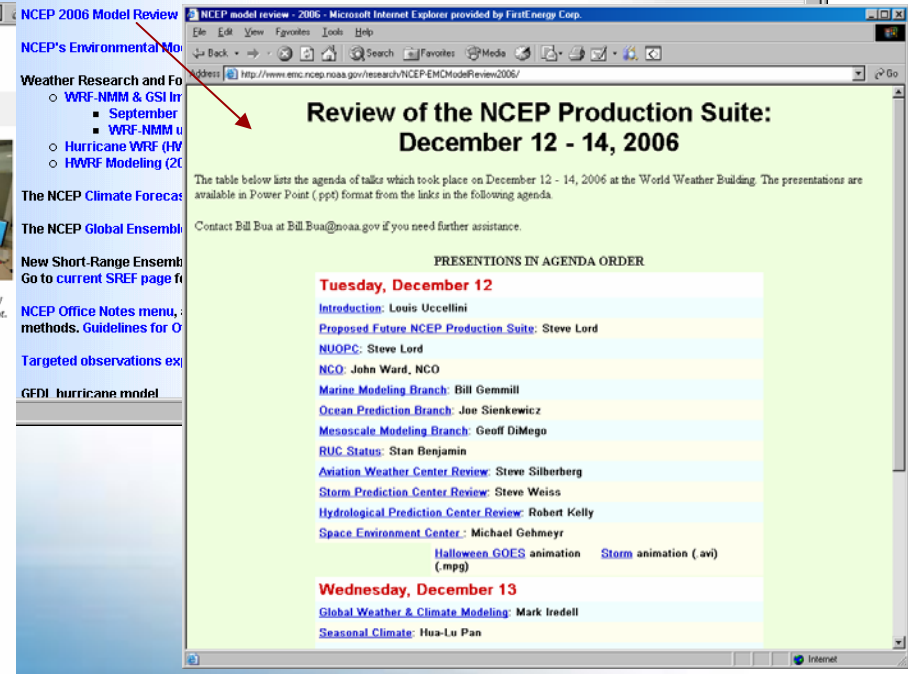
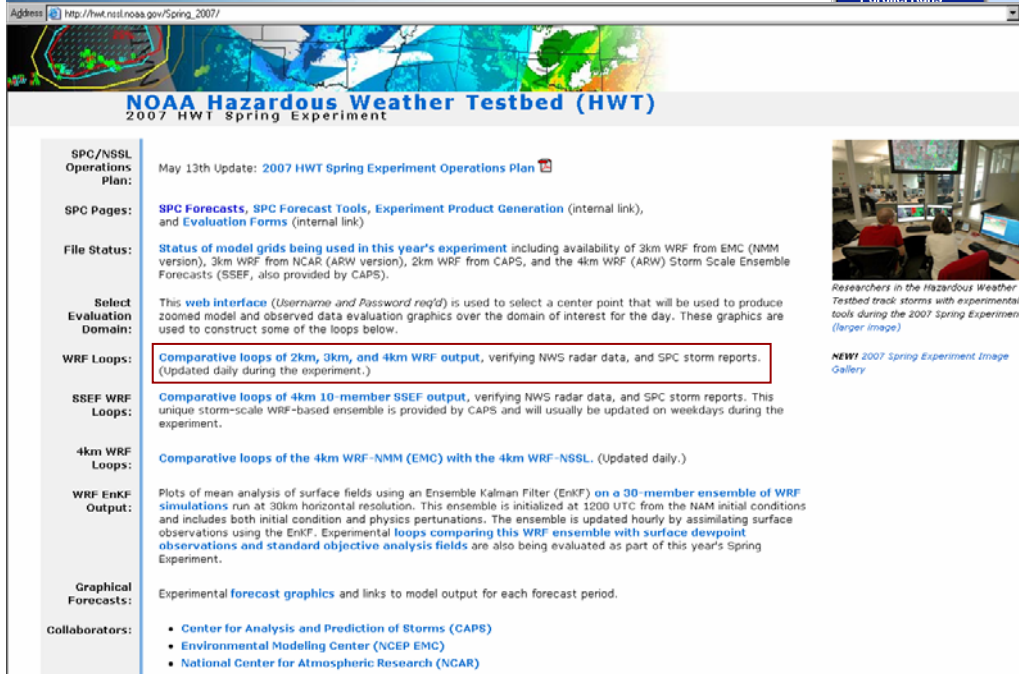
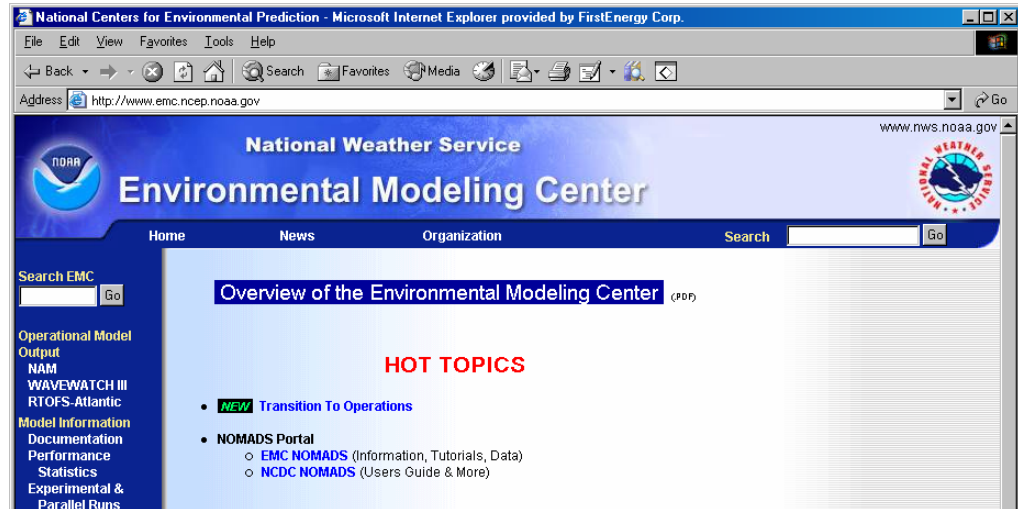
5 day  10 day

Applet AniS started

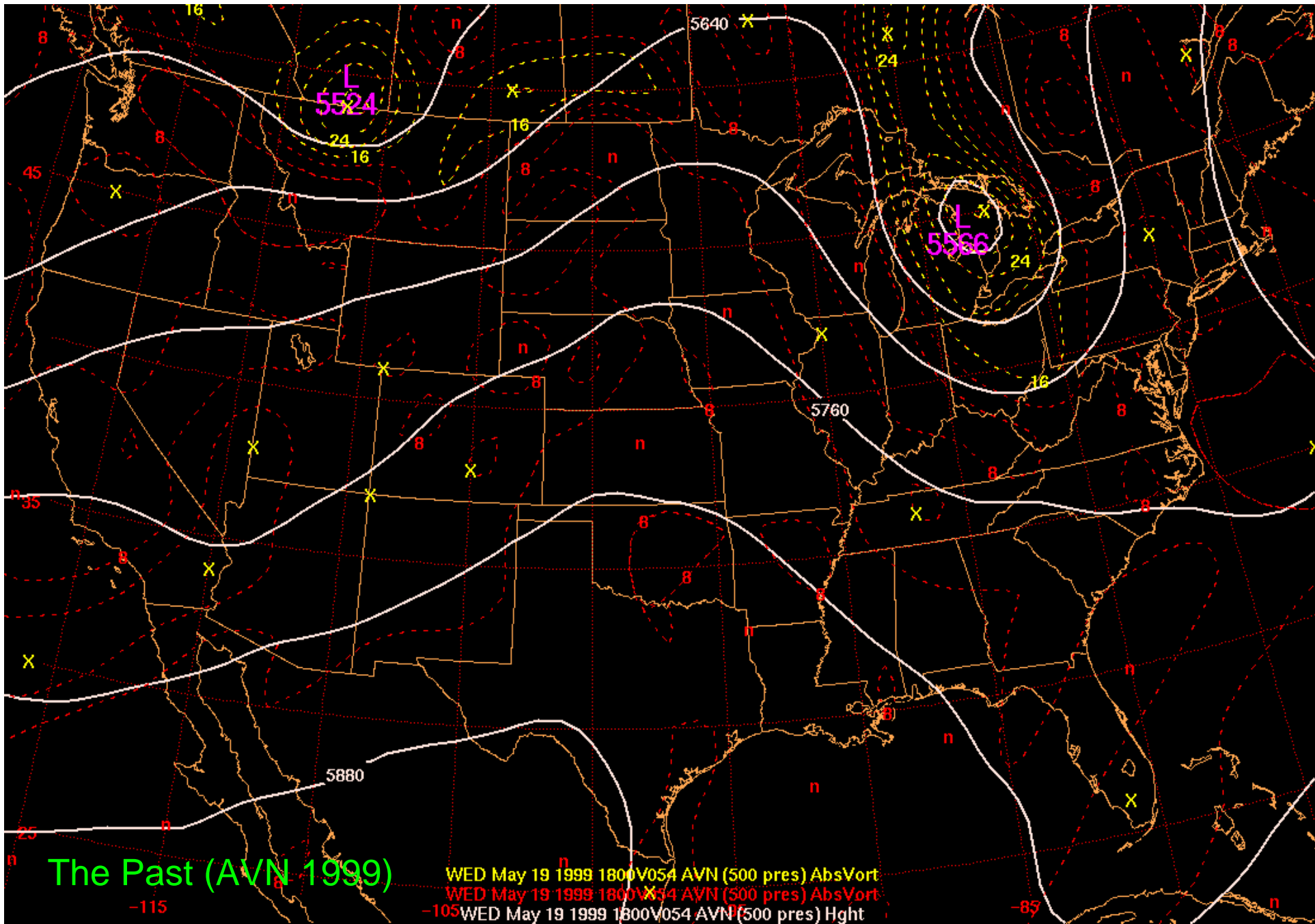
Internet

# Recent and Upcoming Exercises/Meetings

- NOAA EMC Review
- NOAA SPC Spring Experiment



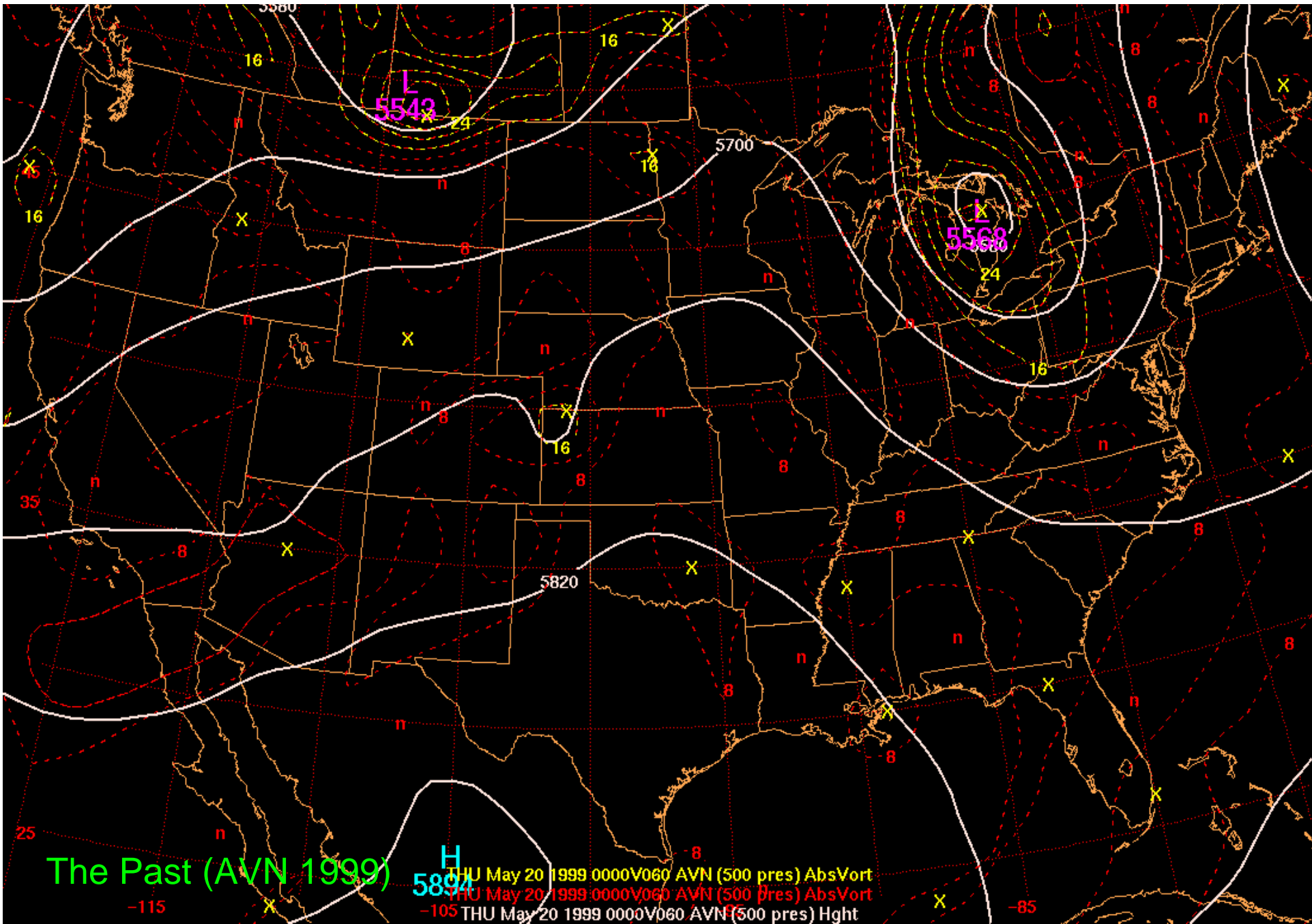
***Gotchas – Precip “bombs”, cloud debris, tropical systems, and other issues nudging may not cure***



The Past (AVN 1999)

WED May 19 1999 1800V054 AVN (500 pres) AbsVort  
 WED May 19 1999 1800V054 AVN (500 pres) AbsVort  
 WED May 19 1999 1800V054 AVN (500 pres) Hght

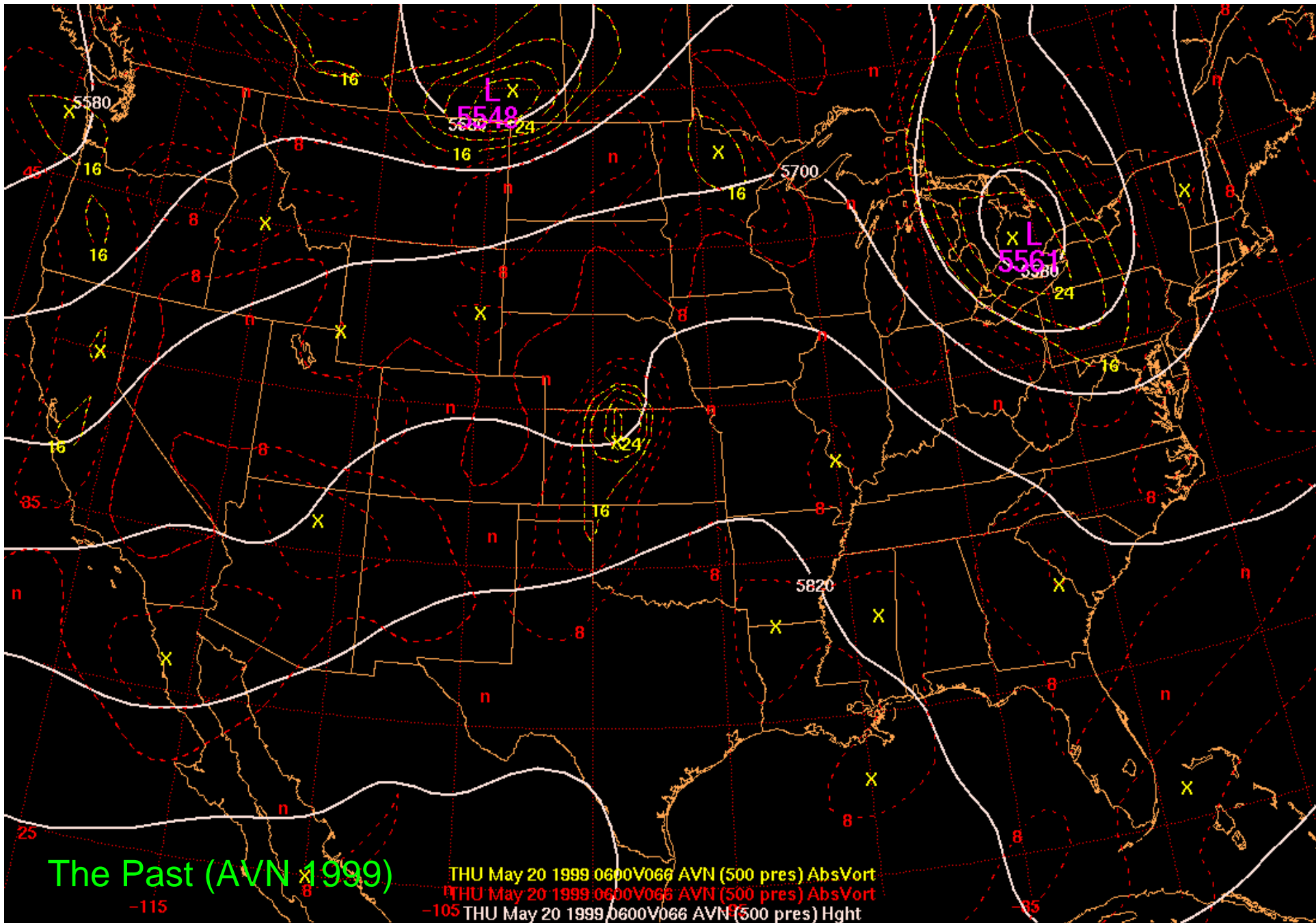


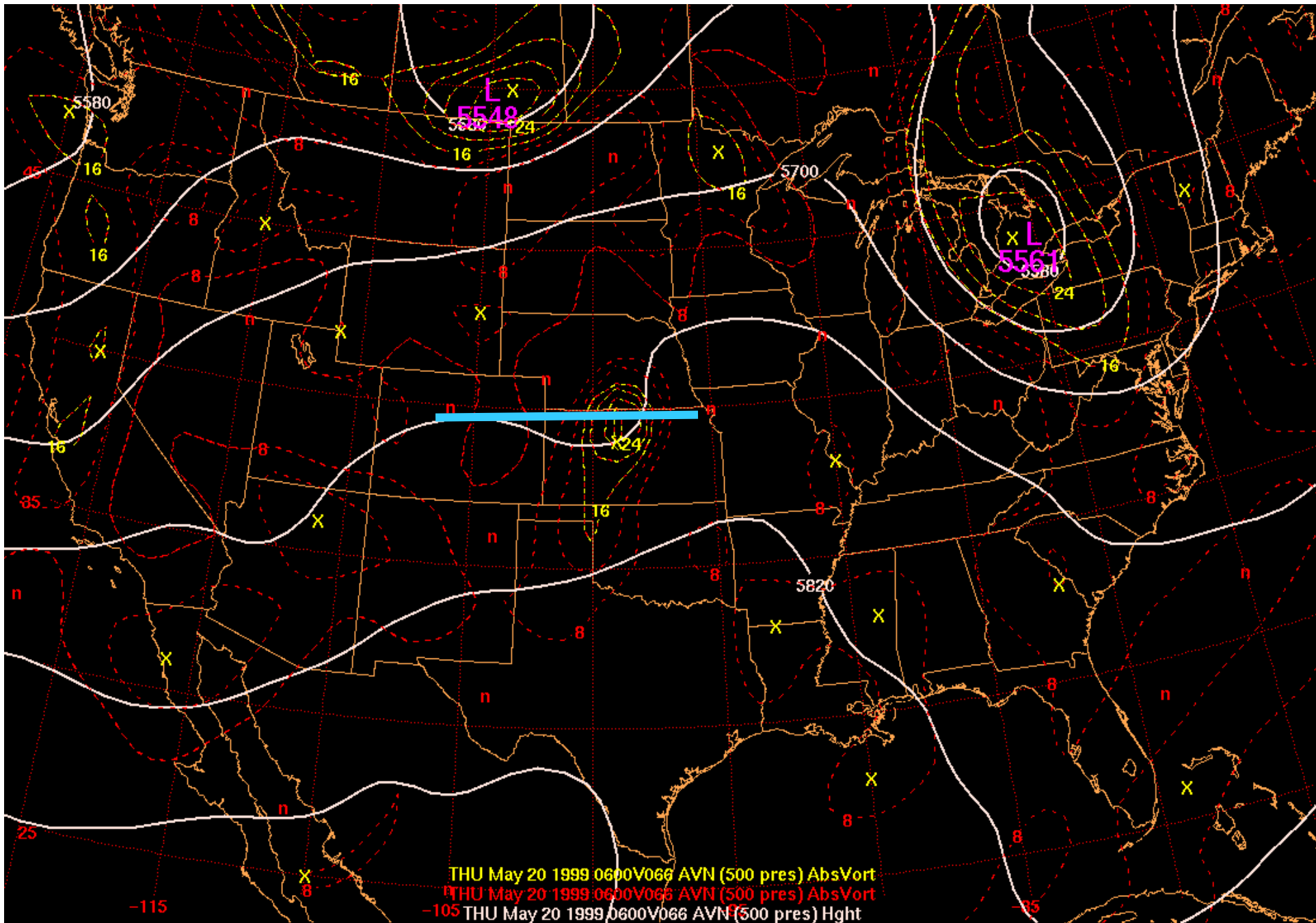


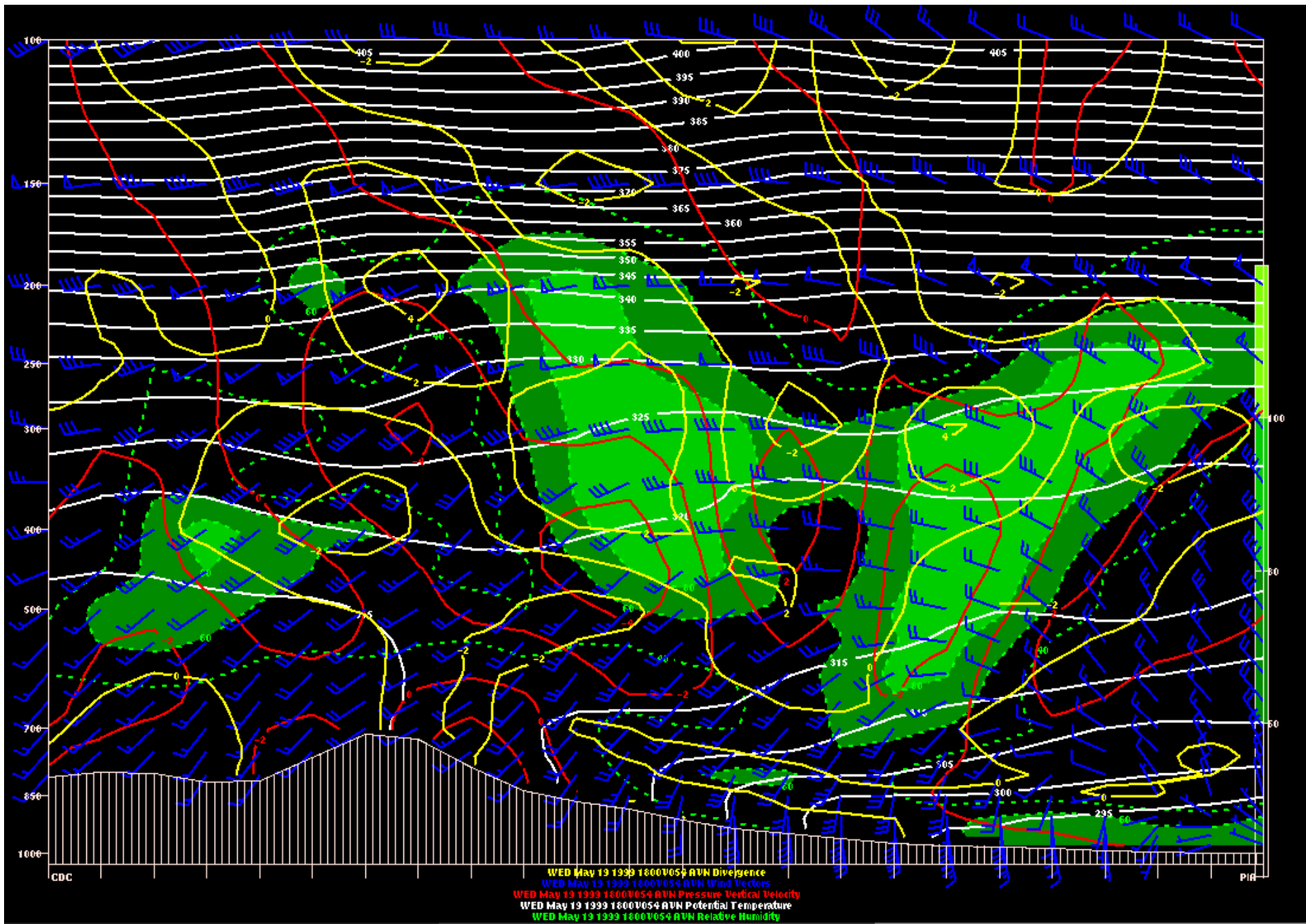
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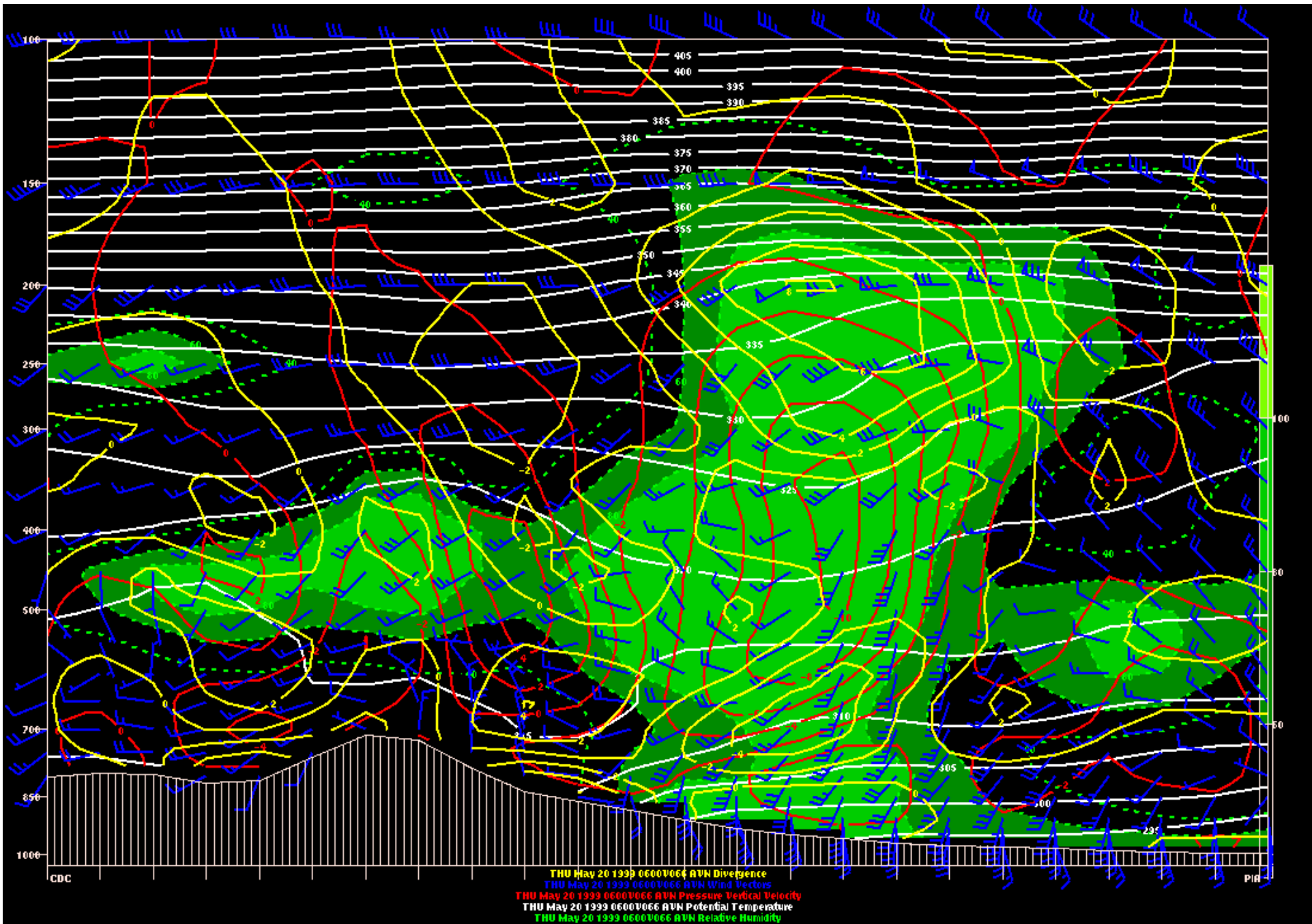
H 5897

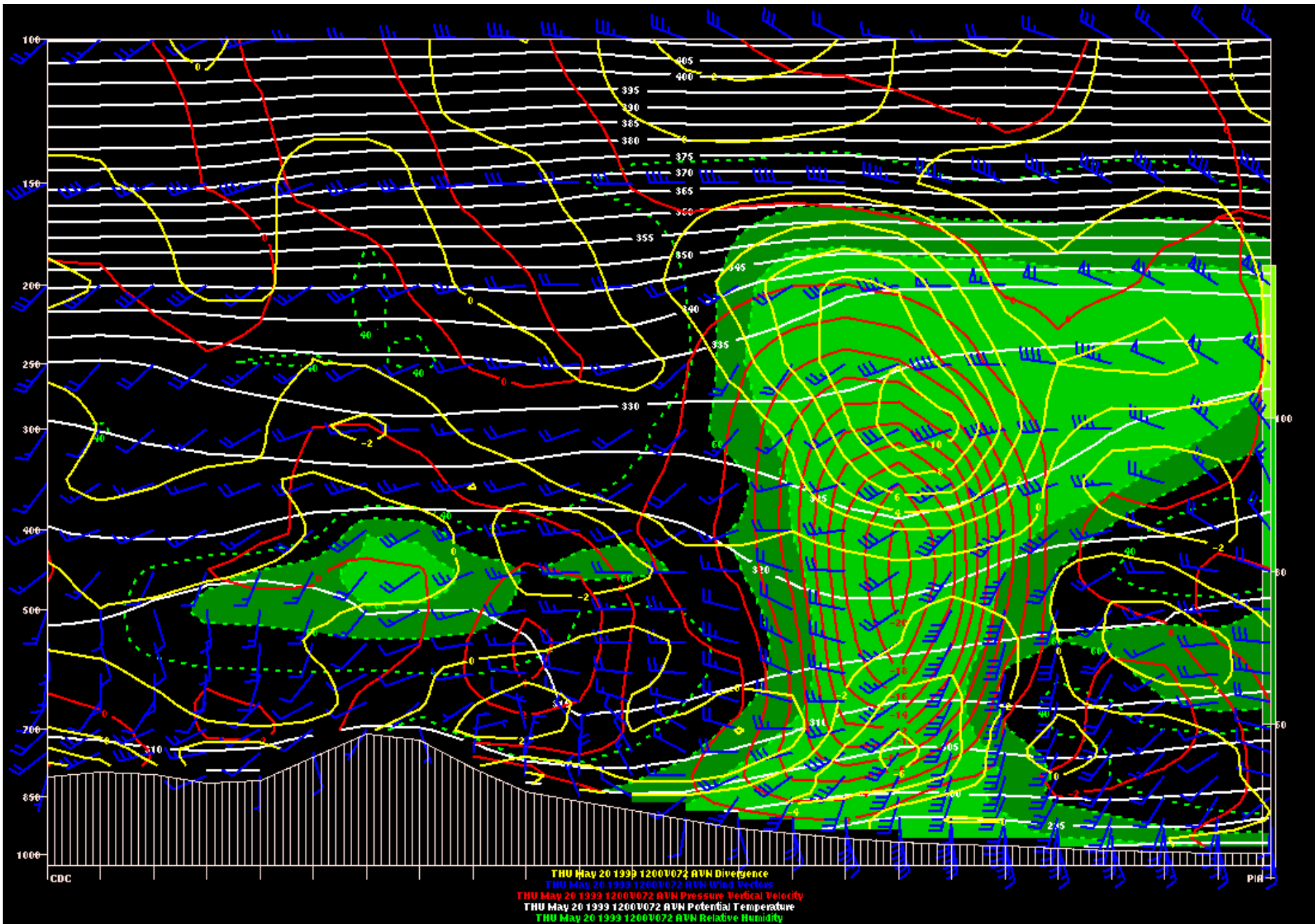
THU May 20 1999 0000V060 AVN (500 pres) AbsVort  
 THU May 20 1999 0000V060 AVN (500 pres) AbsVort  
 -105 THU May 20 1999 0000V060 AVN (500 pres) Hght





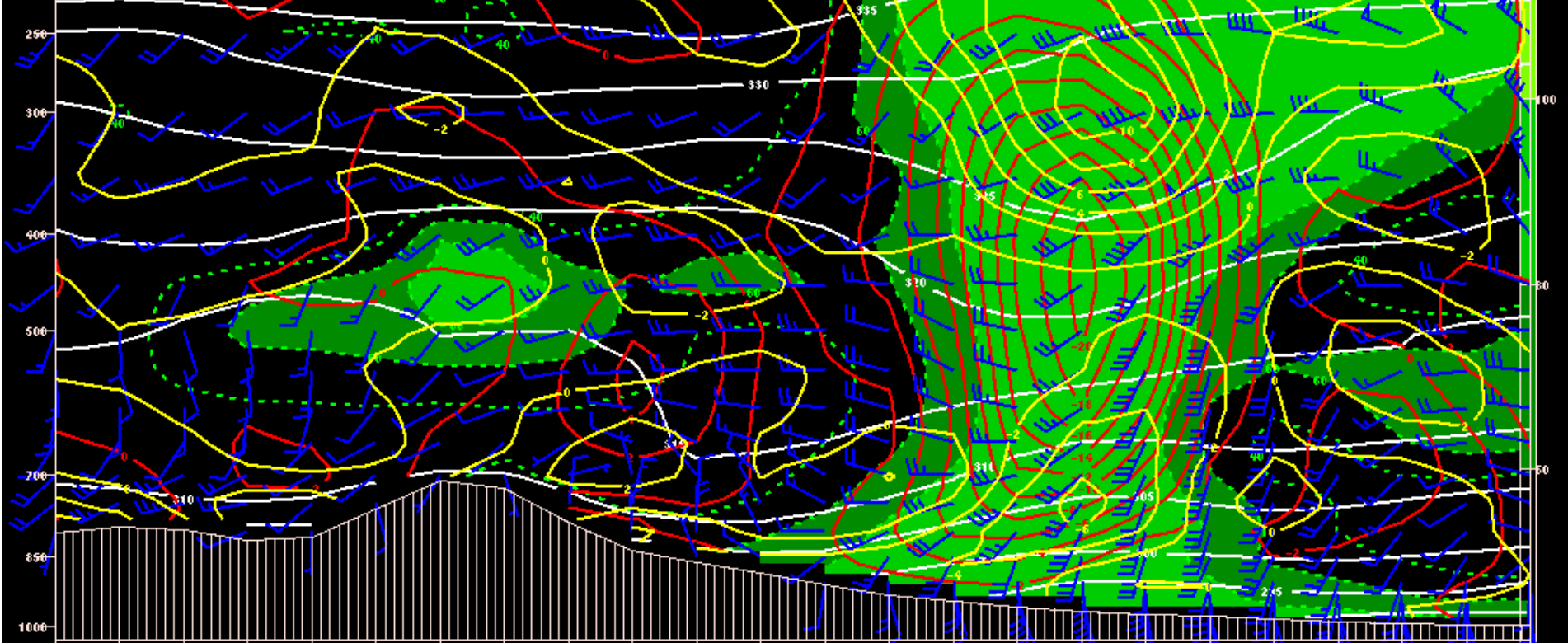








-- NOAA Storm Spotters Guide --  
-- U. of Illinois Cloud Catalog --



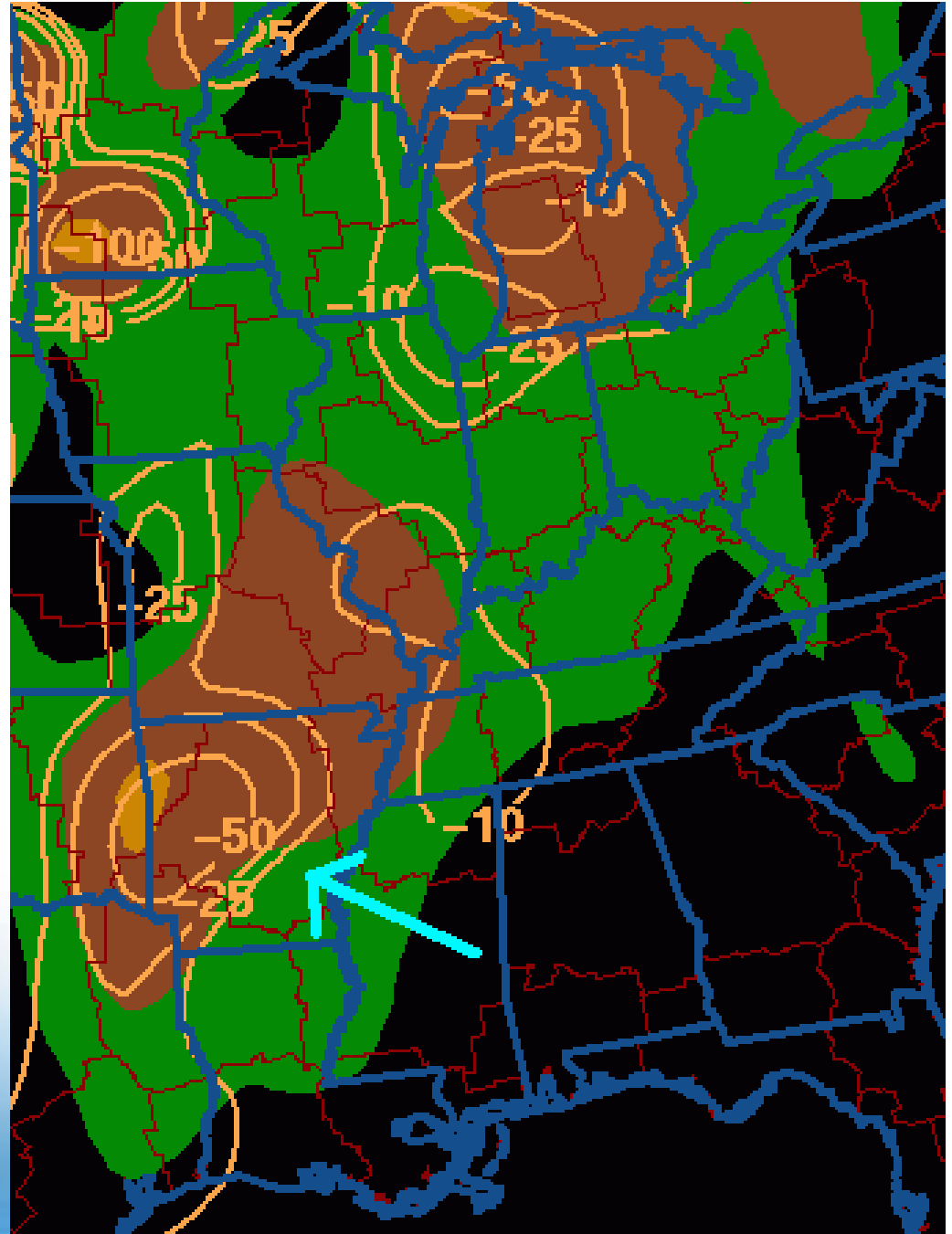
THU May 20 1999 1200V072 AVN Divergence  
THU May 20 1999 1200V072 AVN Wind Vectors  
THU May 20 1999 1200V072 AVN Pressure Vertical Velocity  
THU May 20 1999 1200V072 AVN Potential Temperature  
THU May 20 1999 1200V072 AVN Relative Humidity

# The Present

Shaded = Layer RH (Boundary Layer to approximately 400 mb)  
– 40%, 60%, 80%

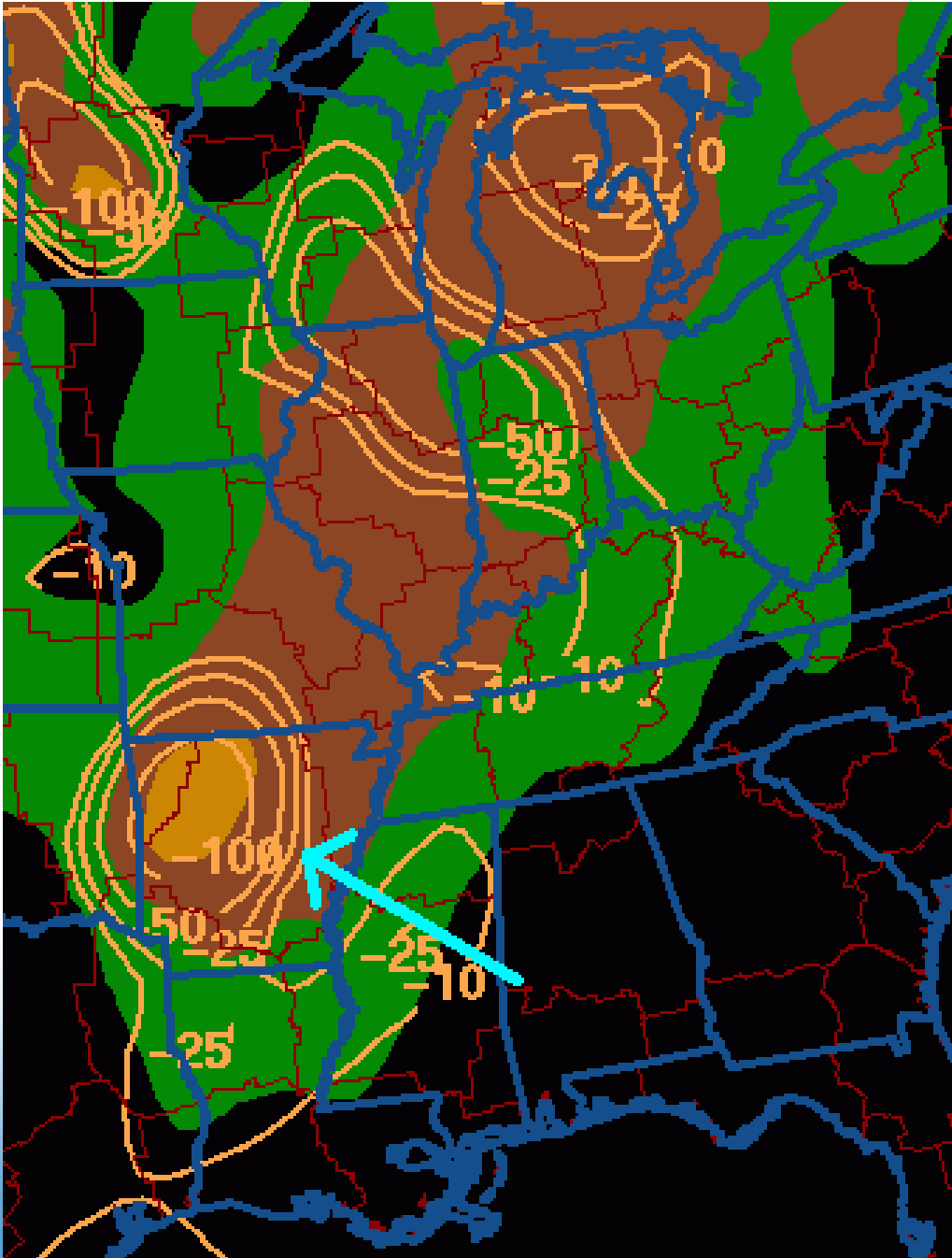
Contours = Layer average  
omega (vertical motion)

Grid scale feedback begins at  
forecast hour 63

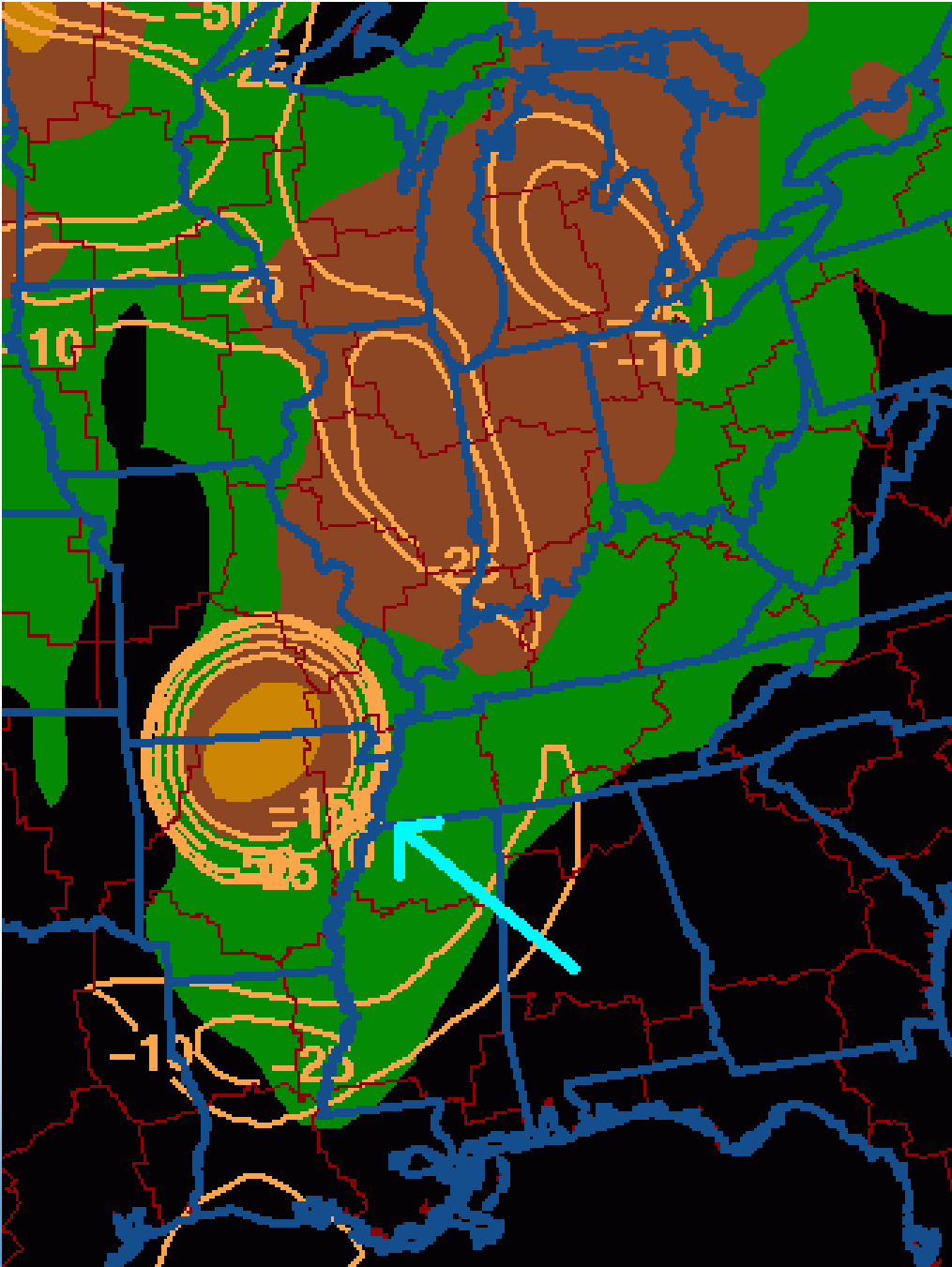




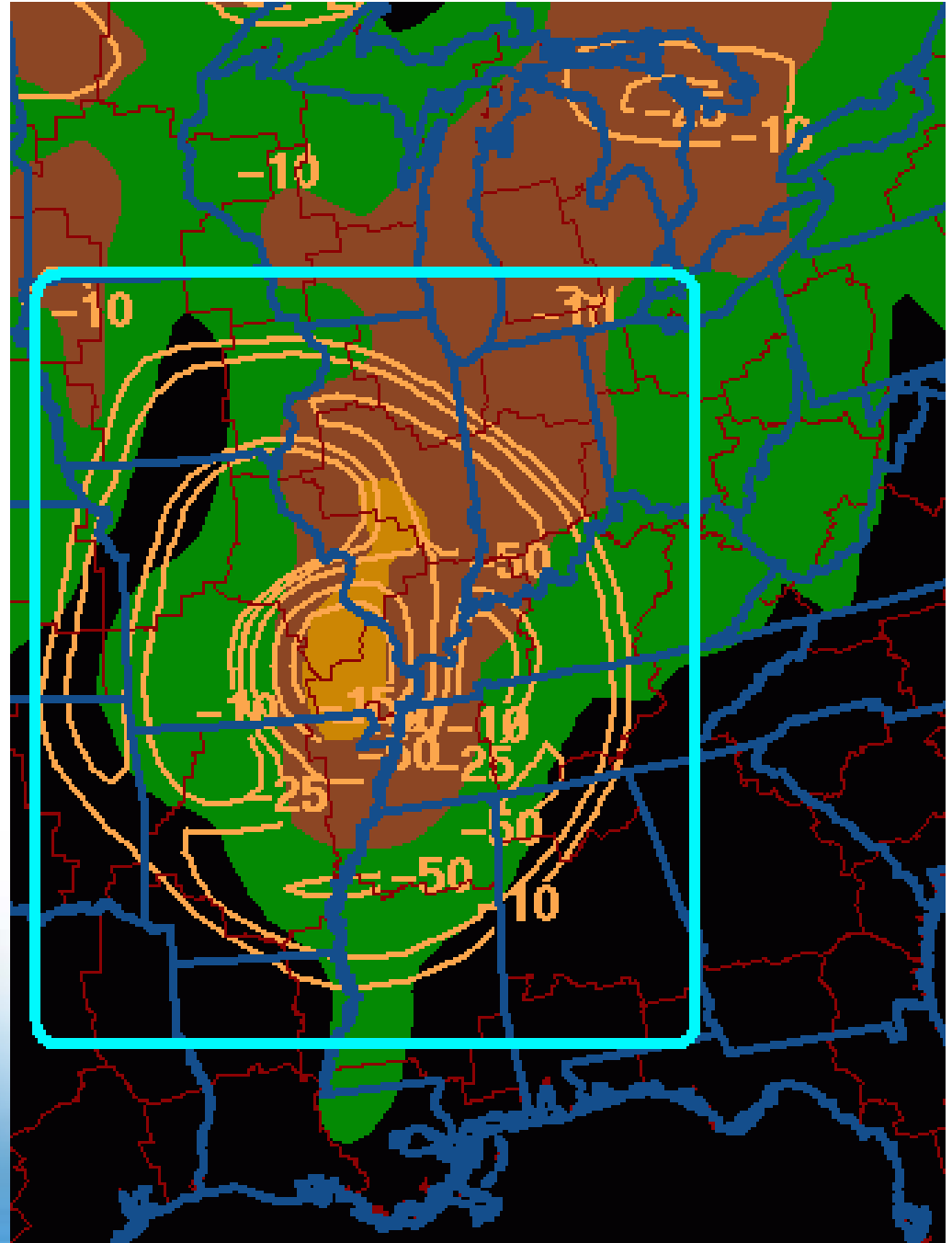
Grid scale feedback intensifies  
at fhr 66



Grid scale feedback intensifies and spreads at fhr 69

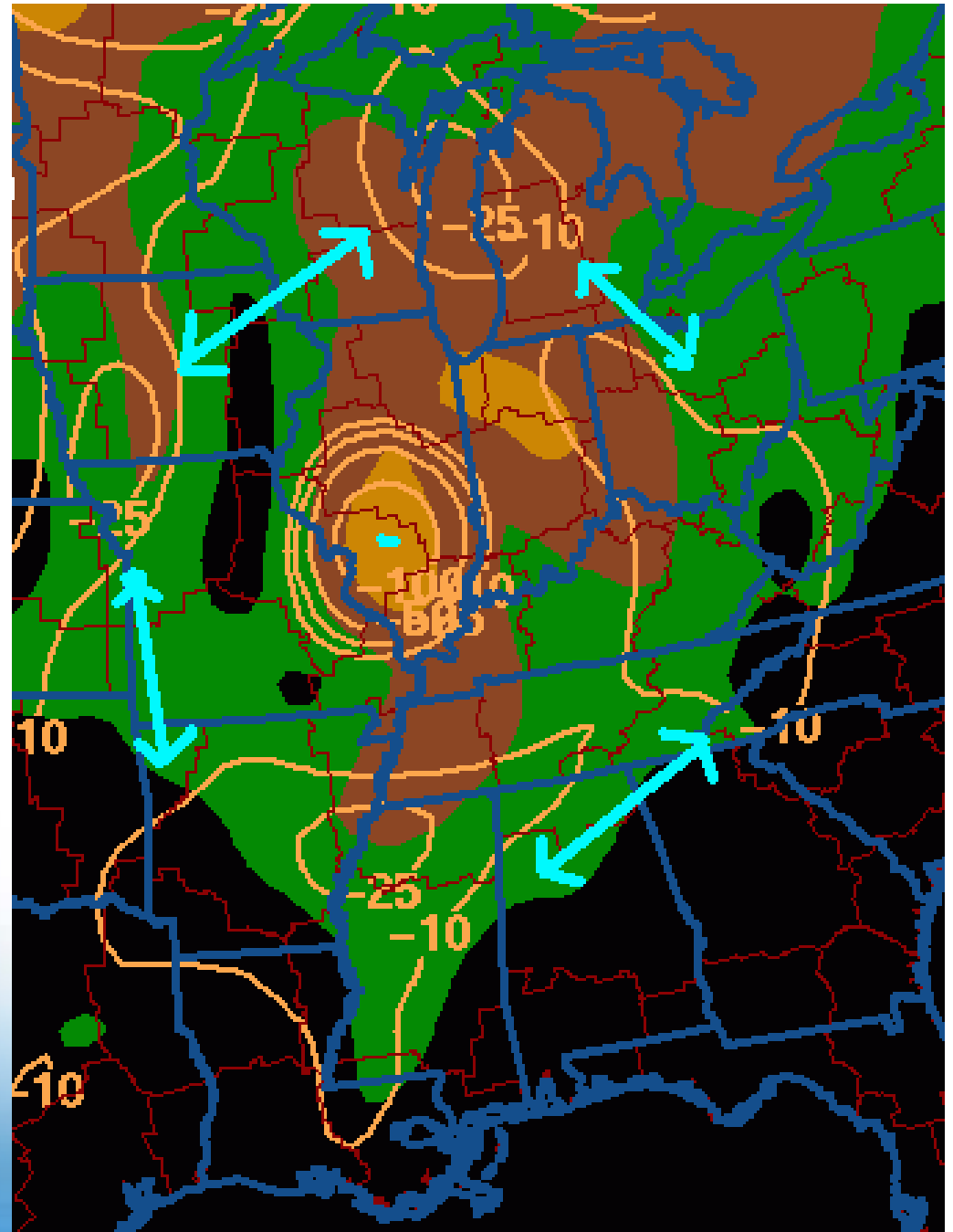


Vertical Motion “waves” spread out from feedback center at fhr 72



Vertical Motion “waves” weaken but continue to race out from feedback center at fhr 78.

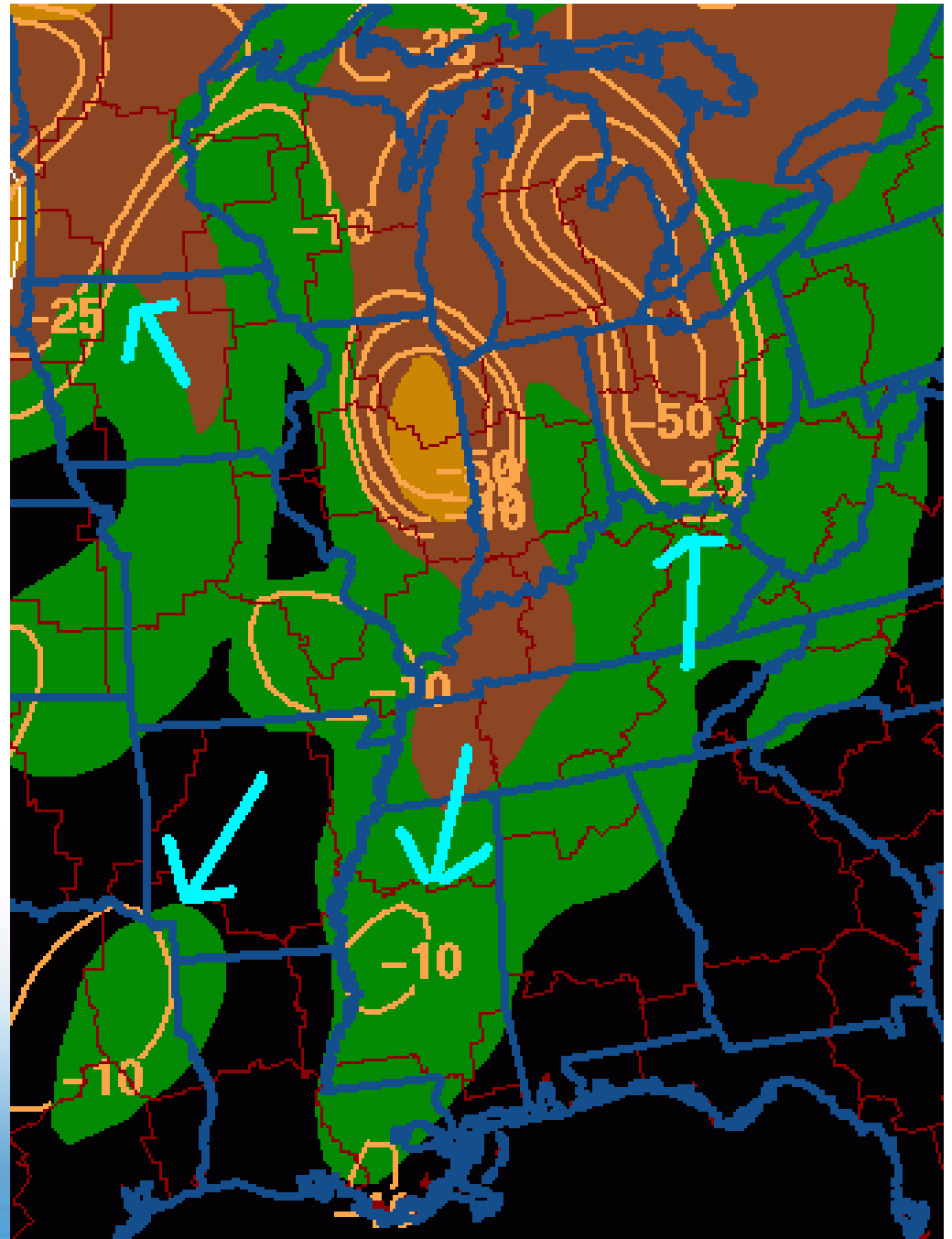
Enhanced vertical motion well away from grid scale feedback may erroneously trigger clouds/precipitation



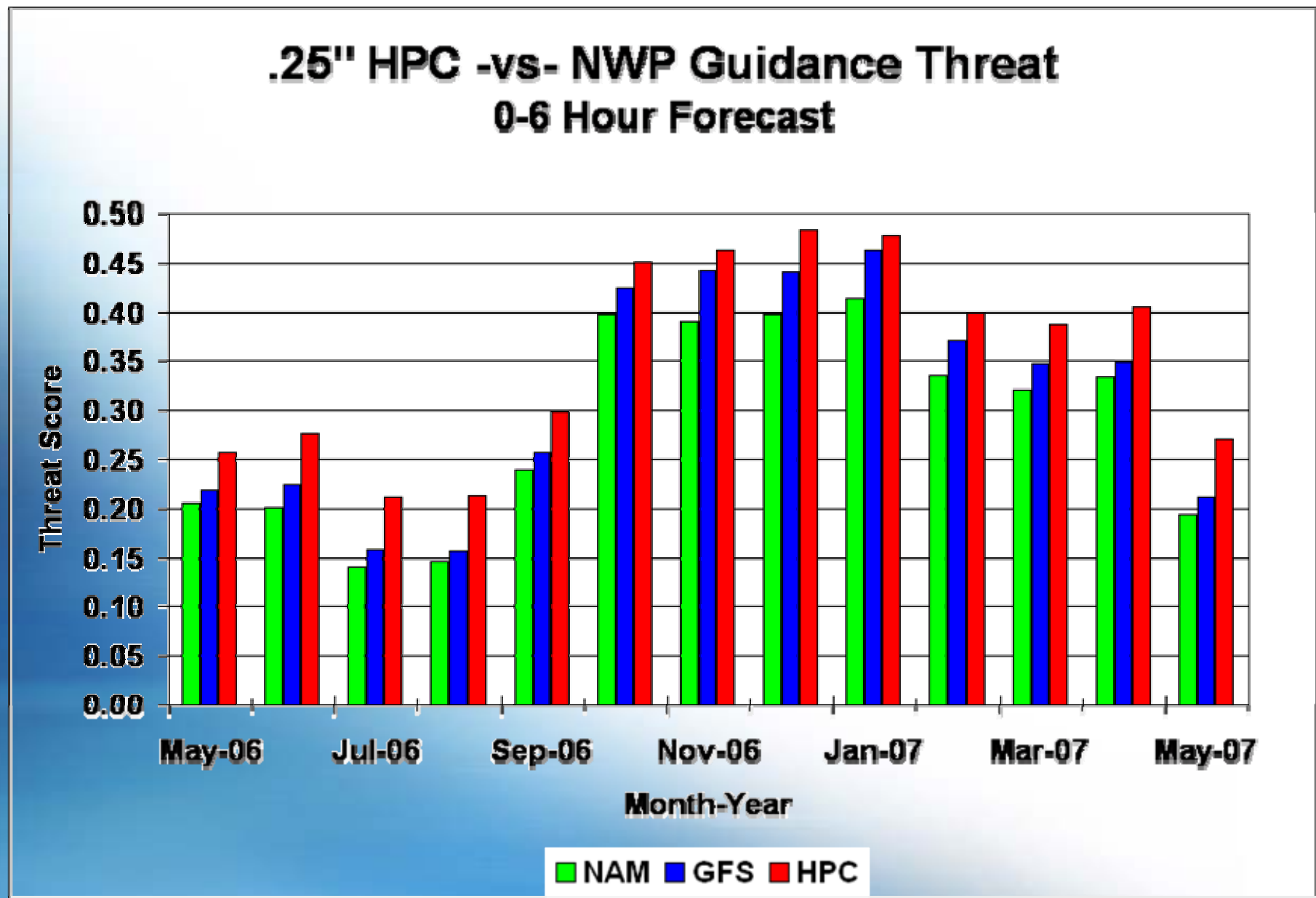
..still going at fhr 81

Making it into RTMA and DAS...

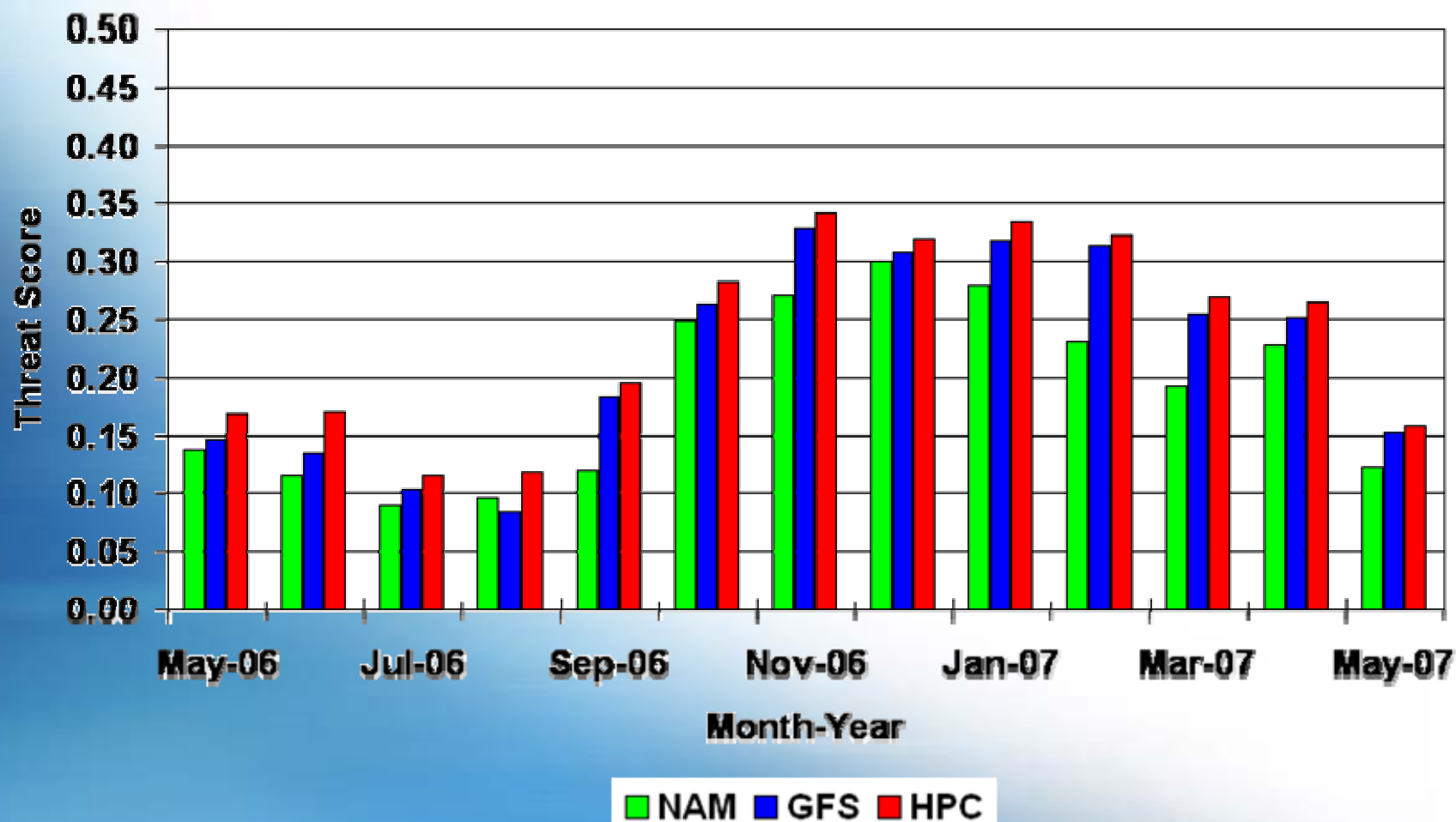
Will be an issue in WRF



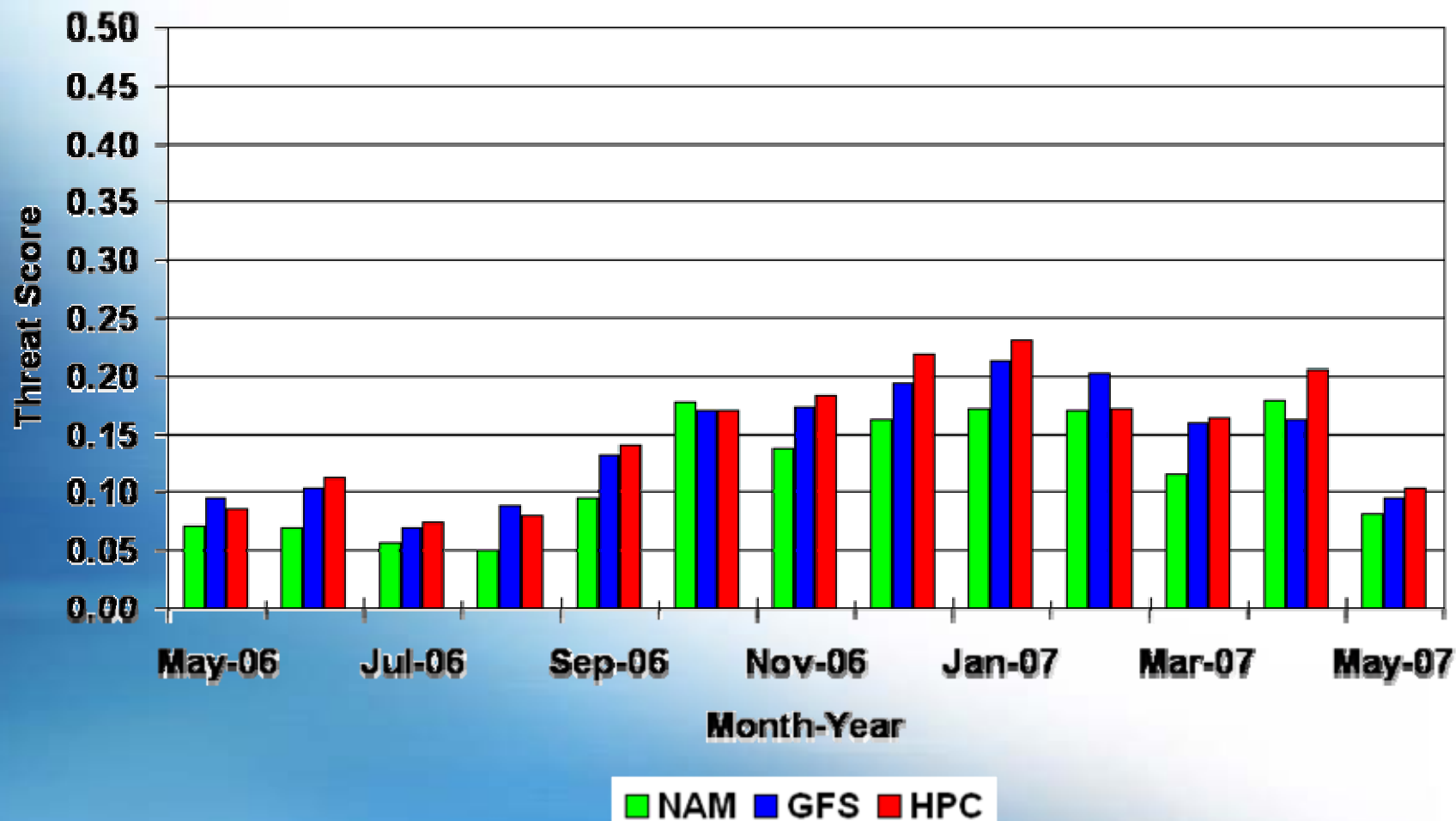
Caution! QPF skill decreases in warm season and with lead time



## .25" HPC -vs- NWP Guidance Threat 30-36 Hour Forecast

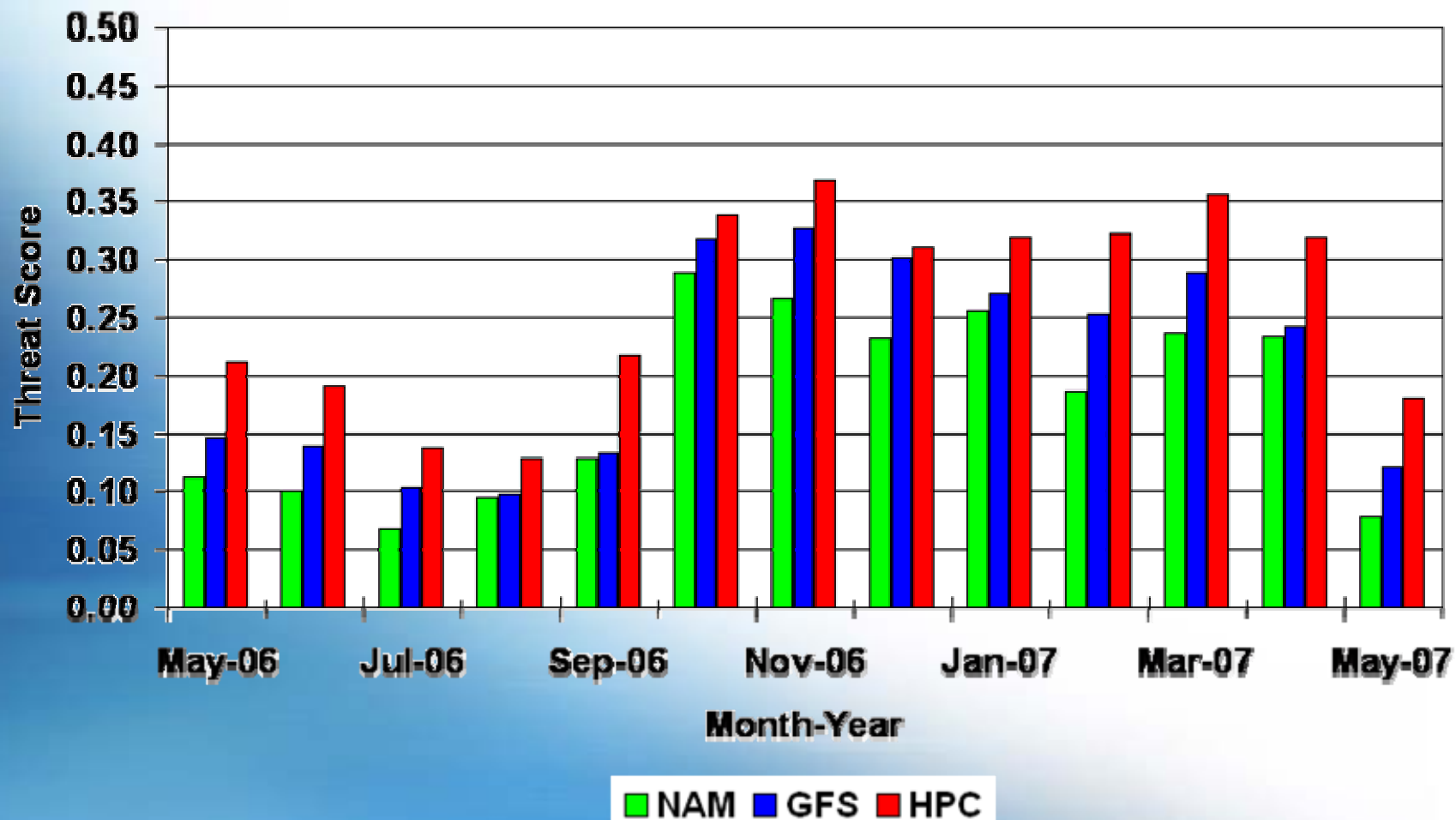


## .25" HPC -vs- NWP Guidance Threat 72-78 Hour Forecast





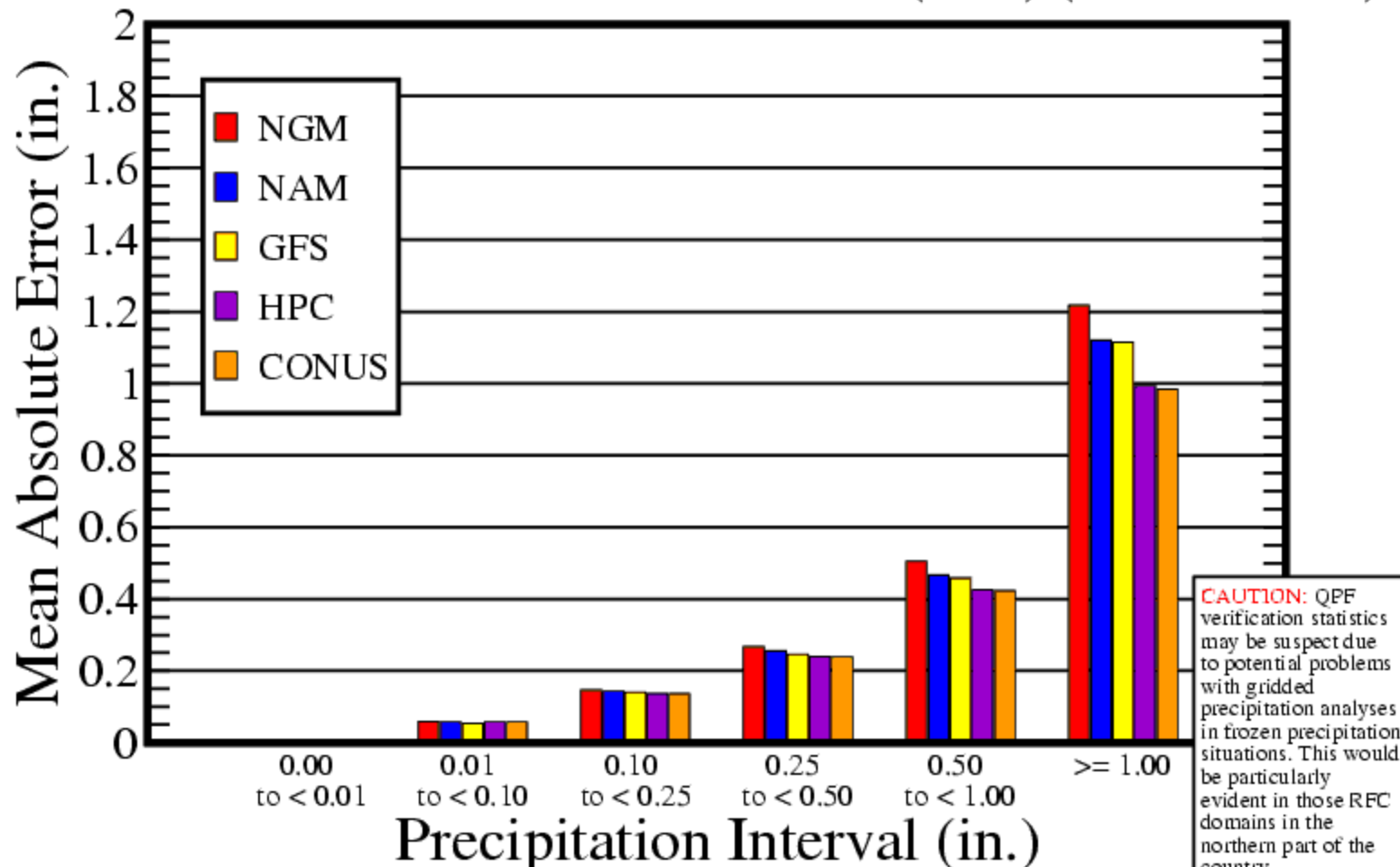
## .50" HPC -vs- NWP Guidance Threat 0-6 Hour Forecast



Ditto on 4km grid

## All Conus RFC Areas - MAE

Jan2005-Dec2005 DAY1 06H GRD(4km) (OBS & FOR)

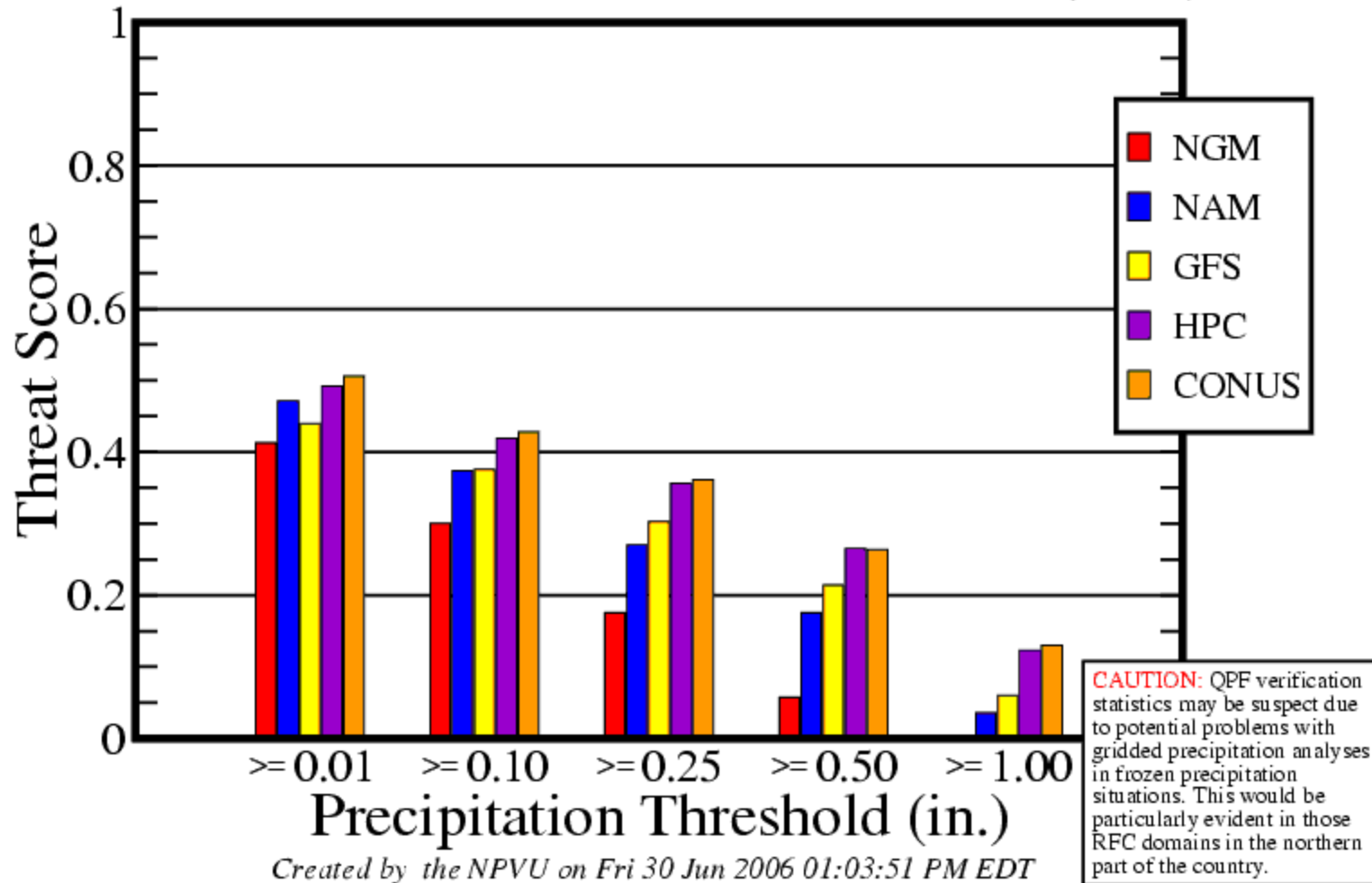


Created by the NPVU on Sun 02 Jul 2006 12:03:01 AM EDT

**CAUTION:** QPF verification statistics may be suspect due to potential problems with gridded precipitation analyses in frozen precipitation situations. This would be particularly evident in those RFC domains in the northern part of the country.

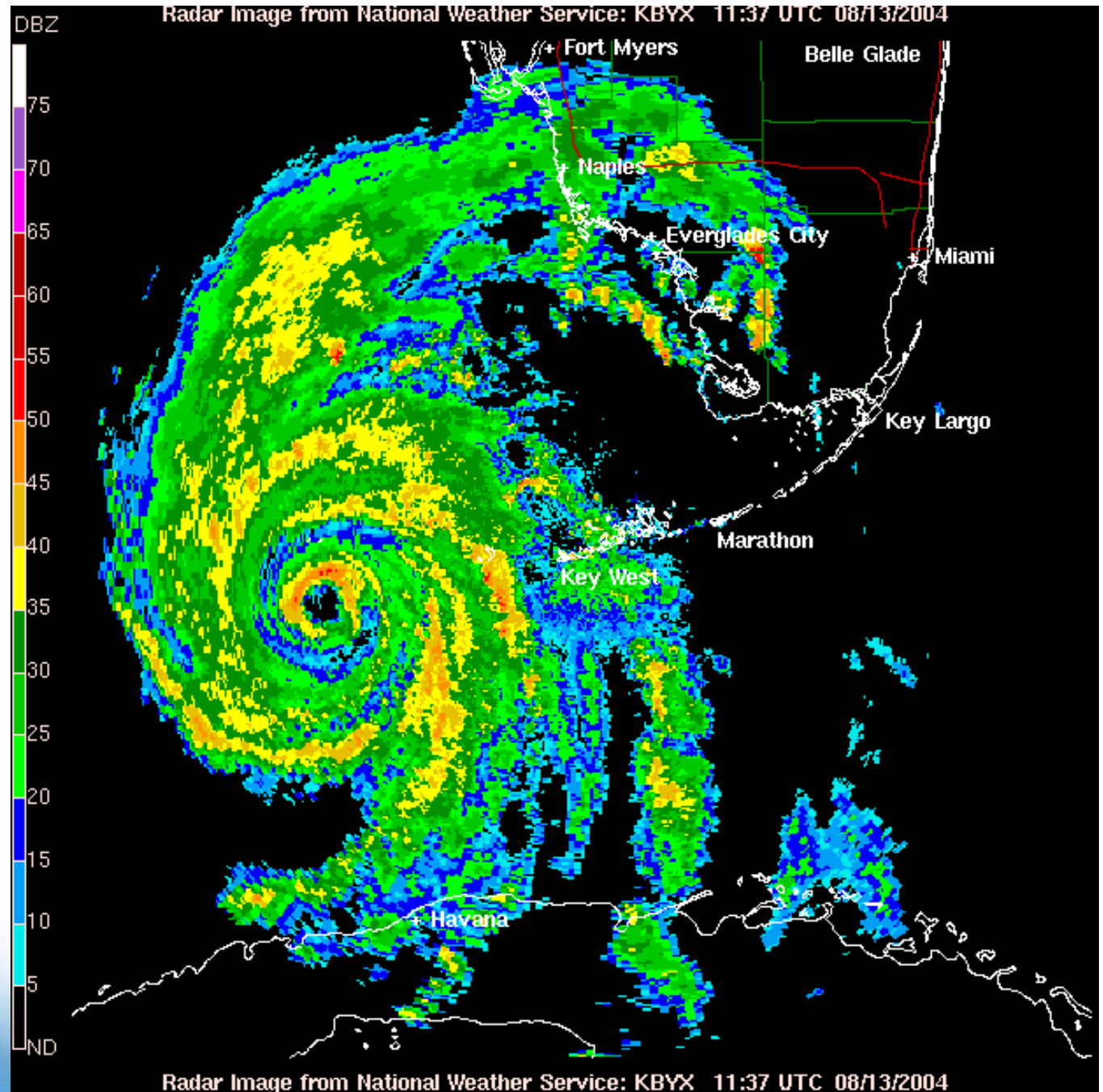
# All Conus RFC Areas - TS

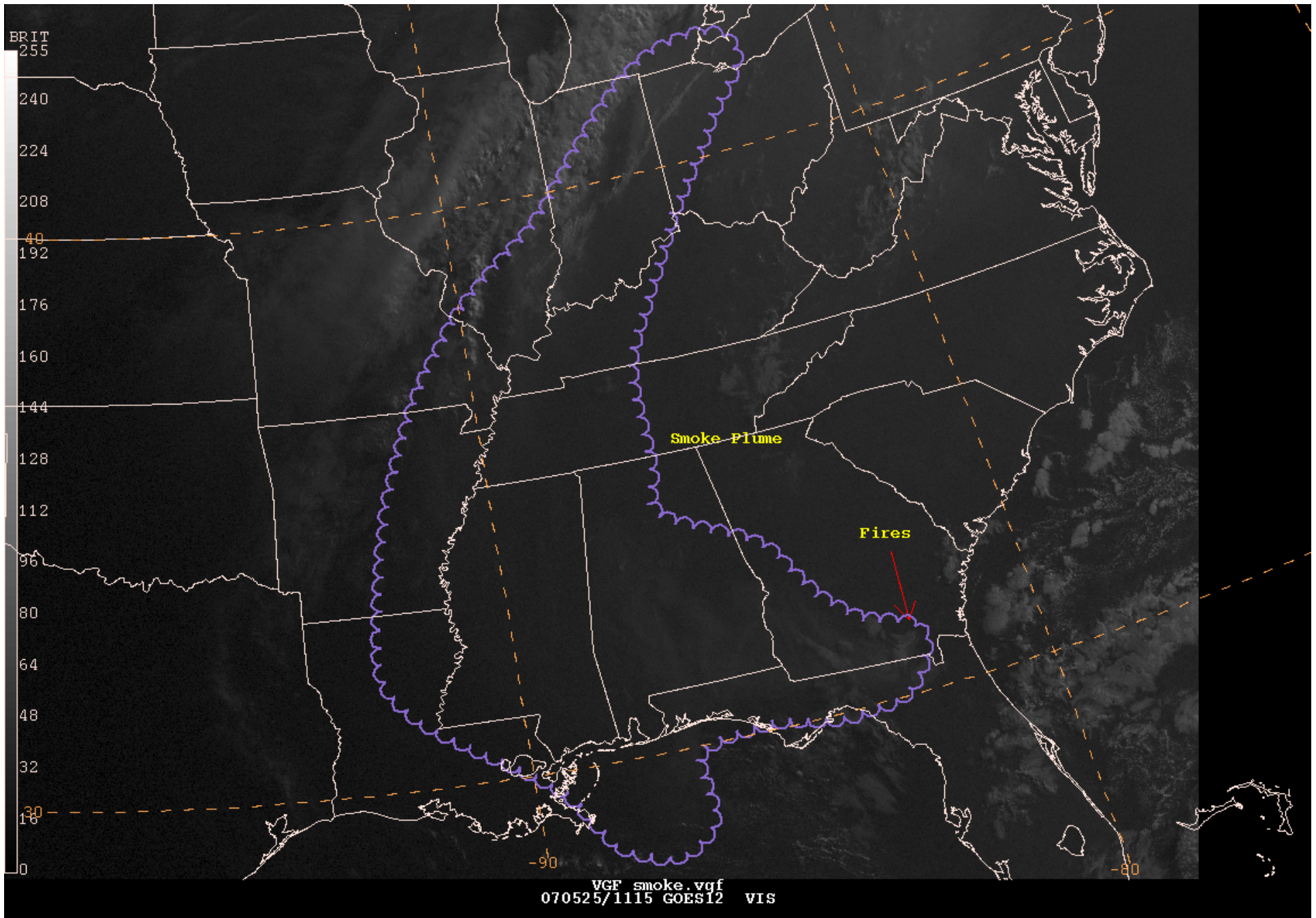
Jan2005-Dec2005 DAY1 06H GRD(4km)



NAM/WRF  
NOT  
good with  
tropicals..

Location or  
intensity – be  
careful with  
2005 studies





***Helpful Info – SST and buoy data sources, ASOS calm and variable wind “rules”, model predicted cloud cover, and free meteorological grid processing software (data extraction from grids into user defined formats)***

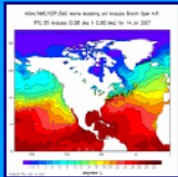


## Real-time, global, sea surface temperature analyses

### Summary of the new and original SST analysis systems

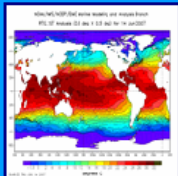
File Name	RTG_SST_HR	RTG_SST
Horizontal Resolution (Lat/Lon Grid)	0.083 degree	0.500 degree
In-Situ Data	Fixed buoys, drifting buoys, and ships	
Satellite Data	NOAA 17 & NOAA 18 AVHRR	NOAA 17 AVHRR
Satellite Processing	JCSDA Physical Retrievals	Navy Retrievals
Implemented	September 27, 2005	January 30, 2001
Status	Operational	Operational

#### Twelfth-Degree RTG\_SST\_HR analysis:



[0.083 Degree RTG\\_SST\\_HR analysis](#)

#### Half-Degree RTG\_SST analysis:



[0.5 Degree RTG\\_SST Analysis](#)

For additional information about data-management and analysis techniques, contact [William.Gemmill@noaa.gov](mailto:William.Gemmill@noaa.gov).

For information about the run cycle and digital data format, contact [Bert.Katz@noaa.gov](mailto:Bert.Katz@noaa.gov).



# National Oceanic and Atmospheric Administration's National Data Buoy Center

Center of Excellence in Marine Technology

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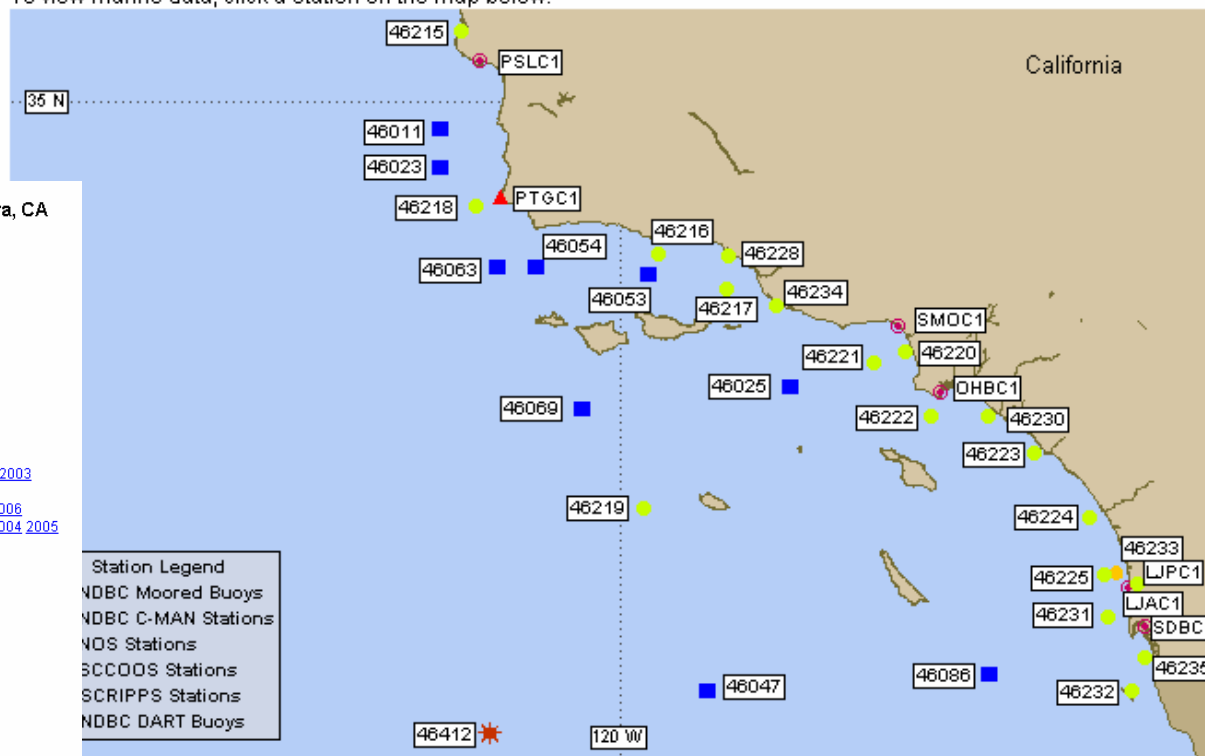
APEX

DART

## Southwest California Recent Marine Data

**Not All Stations Depicted are Operated by the National Data Buoy Center.**

To view marine data, click a station on the map below:



### Station 46053 - SANTA BARB E - 12NM Southwest of San Barbara, CA

Owned and maintained by National Data Buoy Center  
34.24 N 119.85 W (34°14'10"N 119°51'00"W)

Available historical data for station 46053 include:

- **Quality controlled data for 2007** ([data descriptions](#))
  - Standard meteorological data: [Jan](#) [Feb](#) [Mar](#) [Apr](#)
  - Continuous winds data: [Jan](#) [Feb](#) [Mar](#) [Apr](#)
  - Spectral wave density data: [Jan](#) [Feb](#)
  - Ocean current data: [Mar](#) [Apr](#)
  - Ocean data: [Mar](#) [Apr](#)
- **Historical data** ([data descriptions](#))
  - Standard meteorological data: [1994](#) [1995](#) [1996](#) [1998](#) [1999](#) [2000](#) [2001](#) [2002](#) [2003](#) [2004](#) [2005](#) [2006](#)
  - Continuous winds data: [1996](#) [1998](#) [1999](#) [2000](#) [2001](#) [2002](#) [2003](#) [2004](#) [2005](#) [2006](#)
  - Spectral wave density data: [1996](#) [1998](#) [1999](#) [2000](#) [2001](#) [2002](#) [2003](#) [2003b](#) [2004](#) [2005](#) [2006](#)
  - Ocean current data: [1994](#) [1995](#) [1996](#) [1997](#)
- Climatic summary [table](#) (PDF) and plots of
  - [wind speed](#)
  - [air temperature](#)
  - [sea temperature](#)
  - [air-sea temperature](#)
  - [dew point temperature](#)
  - [air-dew point temperature](#)
  - [sea level pressure](#)
  - [peak wind](#)
  - [wind gust](#)
  - [significant wave height](#)
  - [average wave period](#)
  - [dominant wave period](#)

Some data files have been compressed with the GNU [gzip](#) routine. If you do not have gzip, you may retrieve [gzip sources and executables](#) from this server.

pt. of Commerce  
National Oceanic and Atmospheric Administration

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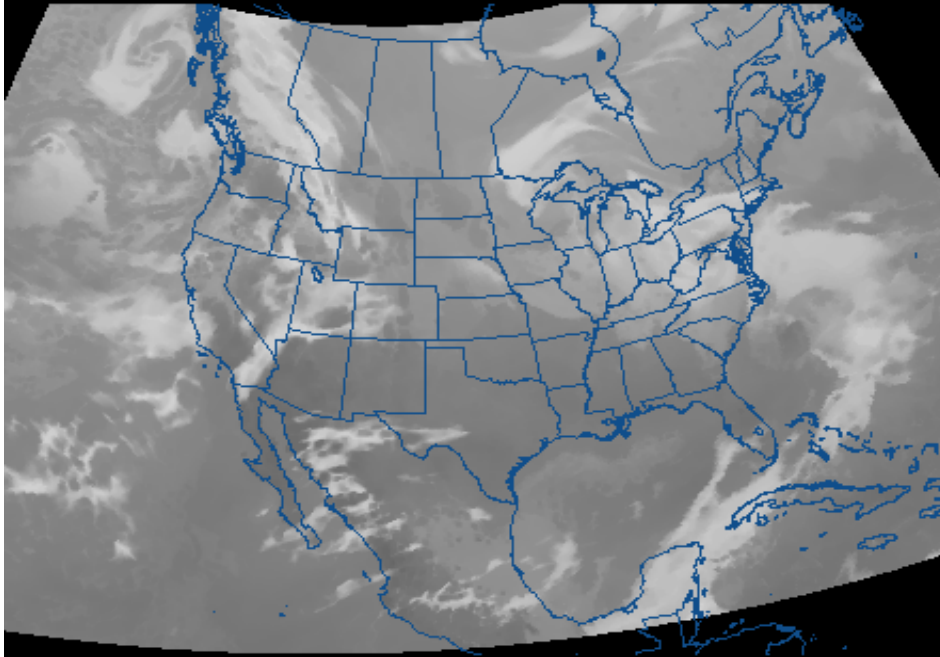
Ad Hoc Met Meeting • June 14 – 15, 2007



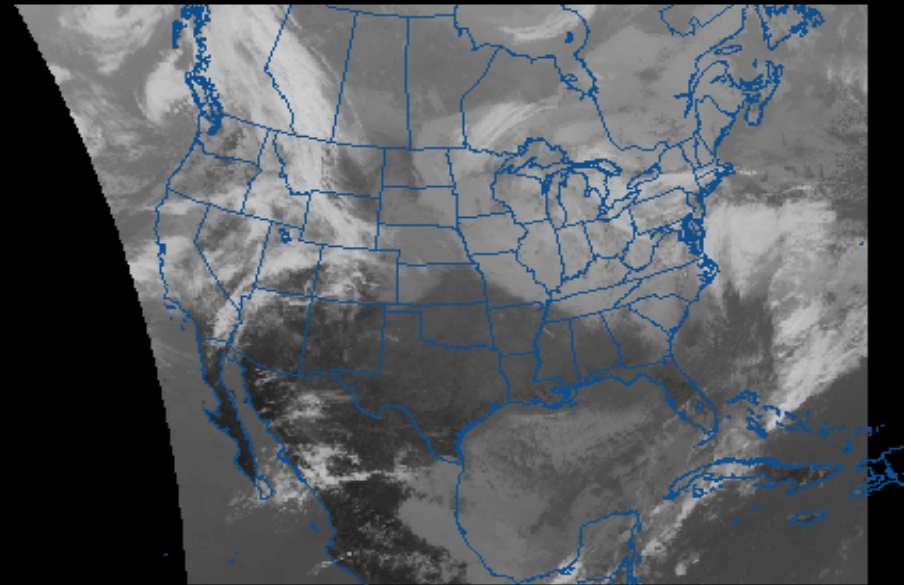
# ASOS Wind Rules (Calm and Variable)

- Every 5 seconds a running 2-minute average wind (direction and speed) is computed and used to further compute wind character.
- If the computed 2-minute average wind speed is 2 knots or less, the 2-minute average wind direction and speed is reported as “calm” (00000KT).
- If the current 2-minute average wind speed is 6 knots or less, the wind direction and speed is reported as “VRBff,” where “ff” is the current 2-minute average wind speed in knots. For example, a variable wind at 3 knots is encoded as “VRB03.”
- A variable wind is reported when the wind direction varies by 60 degrees or more during the 2-minute evaluation period before the observation.

# Synthetic Satellite Imagery from WRF coming this fall

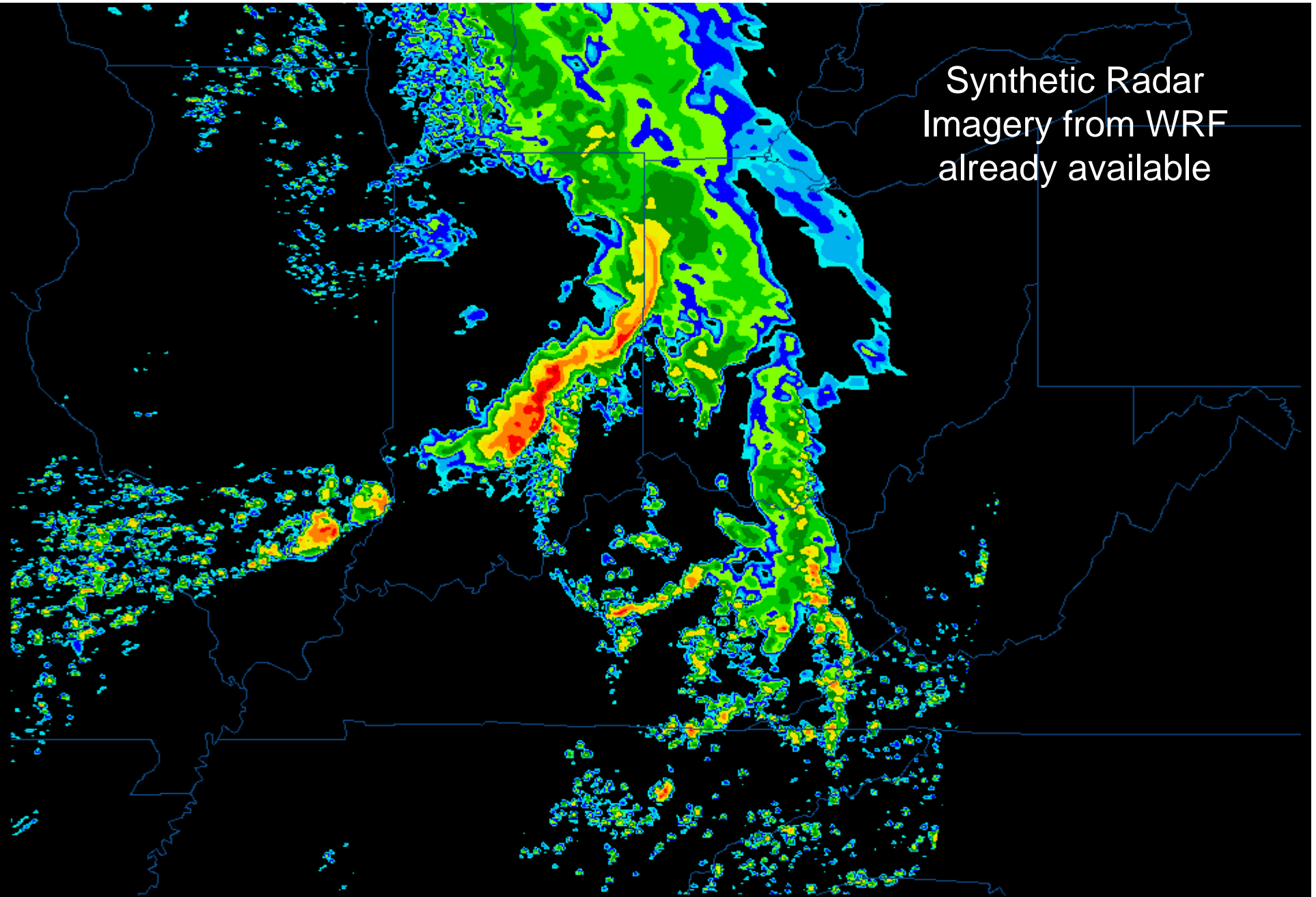


12km N Amer IR Sat (WRF 12km 060324/1800V000)



12km N Amer IR Sat (actual 200603241815)

Synthetic Radar  
Imagery from WRF  
already available



Simulated Reflectivity valid 017Z Thu May 19 2005 (2km WRF CAPS 00Z Run May 19 2005)

# Free Meteorological Gridded Data Manipulation Package (GEMPAK)

Address <http://www.unidata.ucar.edu/software/gempak/>

**Unidata**  
Providing data, tools, and community leadership for enhanced Earth-system education and research

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## Community Corner

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- Community E-letter
- Metrics Assessment
  - Executive Summary
- 2006 Community Workshop
- Unidata Seminar Series
- Unidata Events
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- Job Opportunities
- Acronyms List

## ToolBox

- Downloads
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## Display Analysis

- GEMPAK
- McIDAS
- IDV

## Data Access

- LDM
- IDD
- THREDDS



## GEMPAK / N-AWIPS

GEMPAK is an analysis, display, and product generation package for meteorological data. It is used at National Centers for producing operational forecast and analysis products. Graphical User Interfaces provide convenient access to interactive data manipulation. A comprehensive set of decoders enables integration of real-time and archive data, products, and bulletins. [more >](#)

## GEMPAK News and Announcements

Posted: 2007-04-11

### New GEMPAK / N-AWIPS 5.10.2 Release

A new release of GEMPAK / N-AWIPS (5.10.2) is now available. See the [GEMPAK / N-AWIPS 5.10 home page](#) for a list of [new features](#) and [download](#) information.

## Getting Started with GEMPAK

- Register as a Unidata User: [why this is required](#)
- General Package Information
- Download Software
- Site Configuration for Products

## GEMPAK Documentation and Training

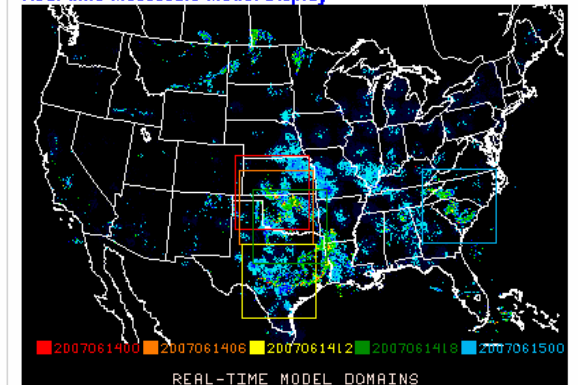
- GEMPAK User Guide/Manual Help Pages
- GEMPAK Workshop/Tutorial: [html](#) [pdf](#)
- Current GEMPAK Release Information
- GEMPAK Installation Guide
- GEMPAK configuration and LDM setup

## GEMPAK Support

- Subscribe to the [GEMBUD](#) (GEMPAK buddy) mailing list
- Search or browse the GEMPAK support archives
- Search or browse the GEMBUD mailing list archives

## GEMPAK Display Capabilities

### Real-time Mesoscale Model Display



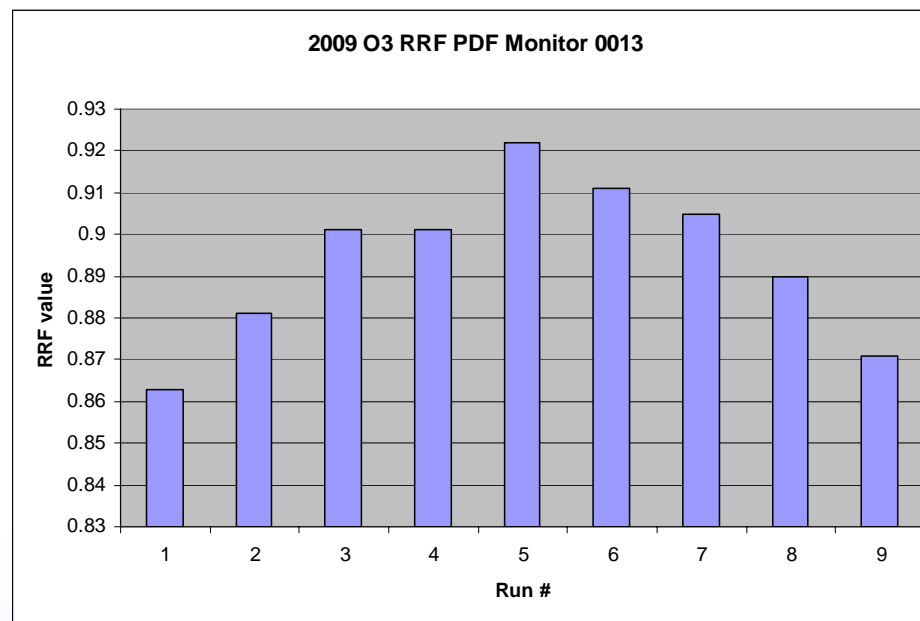
### NEXRAD/IR Satellite Composite



# *Thinking Ahead...*

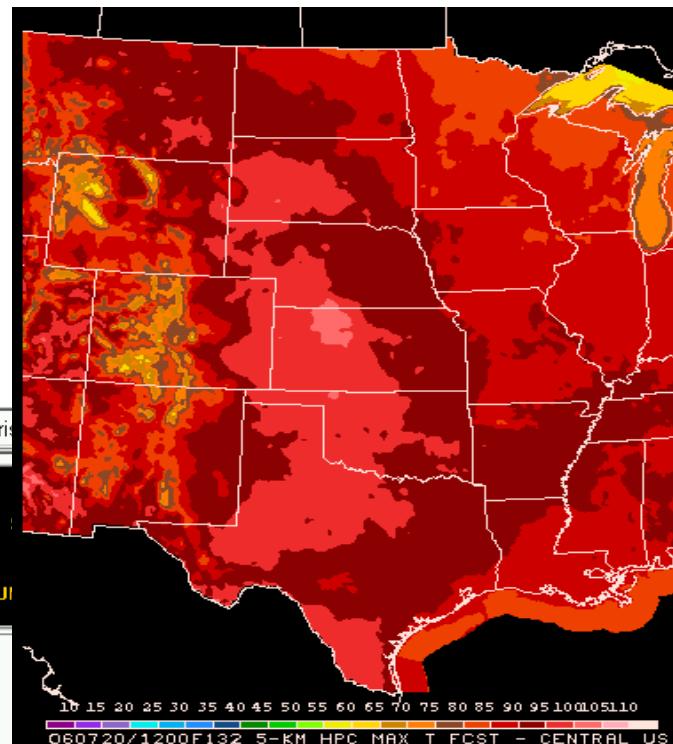
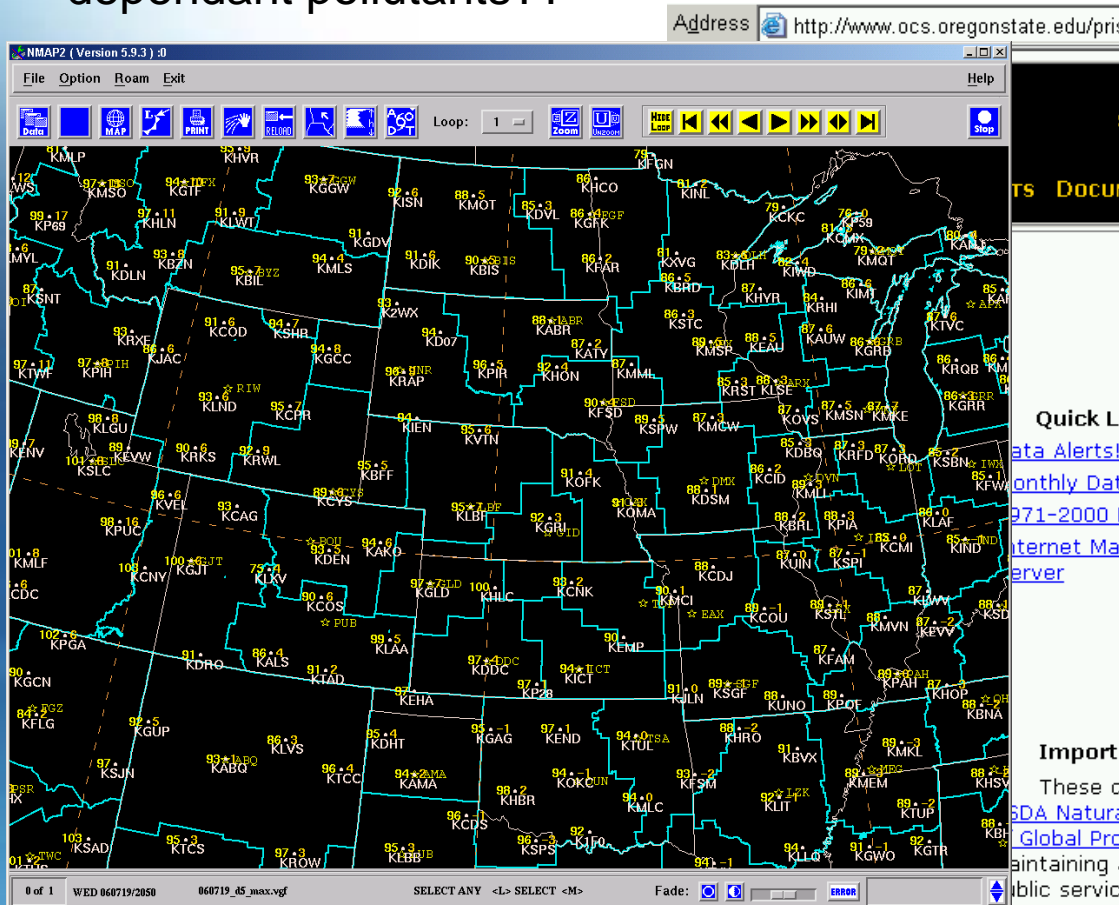
# WOE Strategy?

- Use ensemble based method to construct a “poor man’s” PDF of FY Concentrations
- Centrally generated “met” files from EPA or regional offices
  - WRF ARW core
  - WRF NMM core
  - 5km RTMA
  - RUC 5km
- Two Photochemical Models
  - CMAQ
  - CAMx
- $4 \times 2 = 8$  runs = 8 solutions

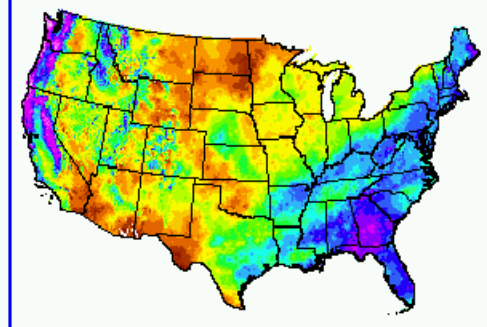


# Downscaling

- Climatological grids at 5km resolution have been used successfully to down scale coarse res grids – could this be done for met dependant pollutants??



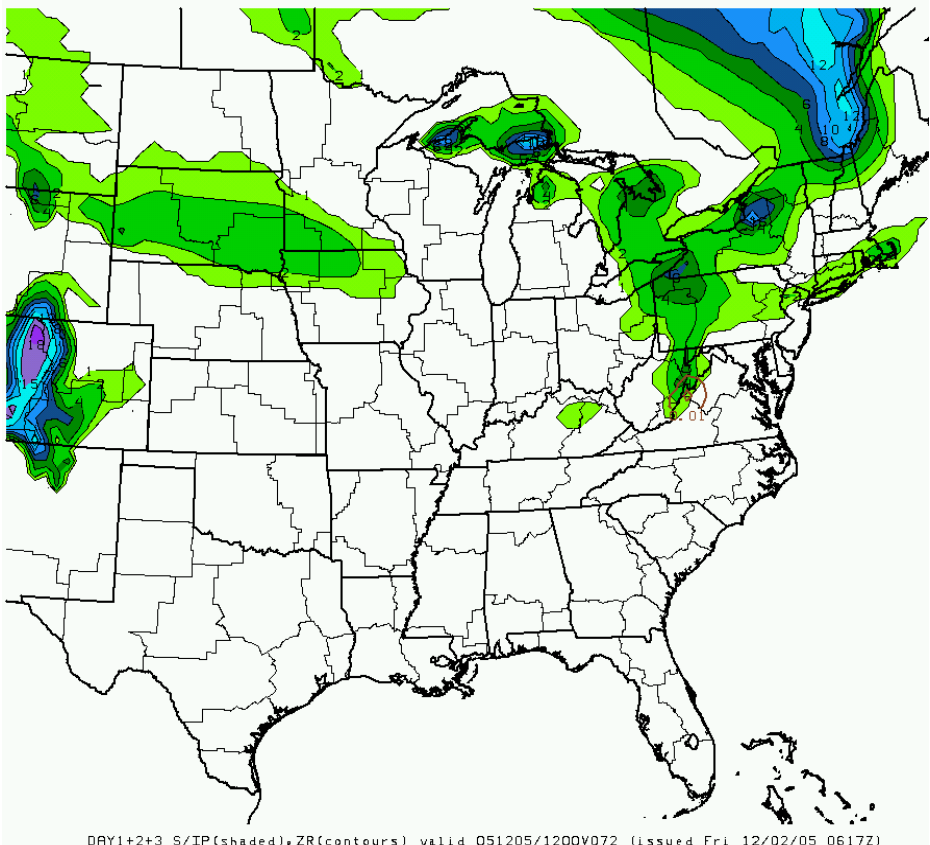
- Quick Links
- [Data Alerts!](#)
  - [Monthly Data](#)
  - [1971-2000 Normals](#)
  - [Internet Map Server](#)



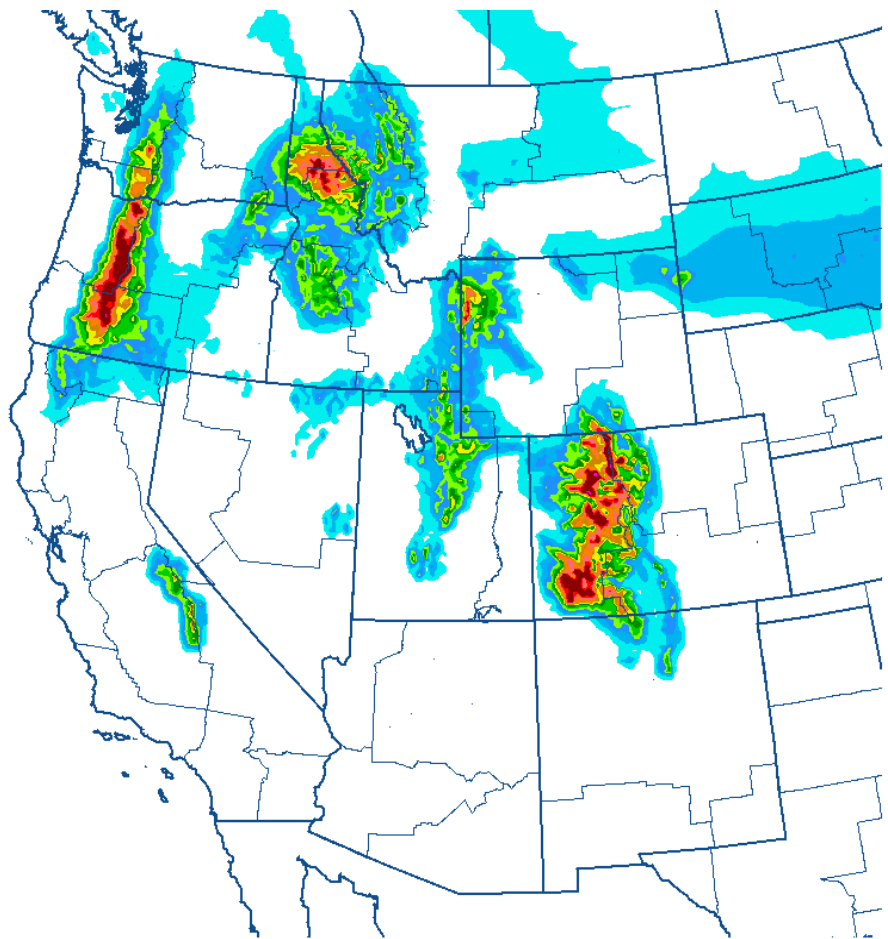
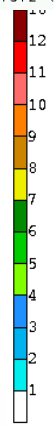
Click to see full-size map. [More...](#)

- [Max Temp](#)
- [Min Temp](#)
- [Dewpoint](#)
- [SPI](#)
- [PPT %](#)

**Important notice:**  
 These data sets have been developed through projects funded partly by the [USDA Natural Resources Conservation Service](#), [USDA Forest Service](#), [NOAA Office of Global Programs](#), and others. However, there is little operational funding for maintaining and updating this web site or the data sets. They are provided as a public service for a limited time. If you find them valuable, please consider doing your part to support the SCAS. [Contact us](#) for details.



DRY1+2+3 S/IP(shaded),ZR(contours) valid 051205/1200V072 (issued Fri 12/02/05 0617Z)



Experimental - Day 1 HPC WWD PRISM Adjusted S/IP accum (in) valid 051203/1200V024 (issued Fri 12/02/05 0457Z)



# Questions & Answers

- [pmanousos@firstenergycorp.com](mailto:pmanousos@firstenergycorp.com)
- 330 761 4484
- <http://www.firstenergycorp.com>