NOAA/INL Meteorological Research Partnership Status

DMCC 14th Meeting
San Antonio, TX
May 7, 2007

U.S. Dept. of Commerce

National Oceanic & Atmospheric Admin. (NOAA)

Air Resources Laboratory

Field Research Division

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2006 Major Activities & Accomplishments

- Began the process to get DOE & NOAA to formally recognize the NOAA/INL Meteorological Research Partnership
  - Memorandum of Agreement
- 10-yr flat funding concerns presented to DOE-ID Senior Leadership Team
- Installed and began internal testing of WRF
- October 4 severe thunderstorm and tornado
- Sharply curtailed activities due to funding limitations

2007 Major Activities & Accomplishments To-date

- Continuing to formalize the NOAA/INL Meteorological Research Partnership
  - Initial MOA was approved by INL attorneys
  - MOA was revised and approved by DOC
  - Awaiting final approval by INL
  - Final step is approval by INL Manager and DOC AA
  - Goal: MOA in place by September 2007
- Designation of StormReady Supporter of INL by NWS
  - First group within NOAA

2007 Major Activities & Accomplishments To-date (cont.)

- WRF is now operational

- Began work on a NOAA/INL Weather Web Page
  - Include NWS and FRD watches and warnings
  - Lightning and personnel safety

- Work continued on the INL Climatology
  - Will be published this summer

- Activities are now "business as usual"
  - Funding was received to support 5-6 FTE's

WRF Mesoscale Modeling

Goal: to provide short-range, high-resolution weather and dispersion forecasts for the INL at modest cost

- 2 horizontal grids at 20 and 4 km spacing
- Initialized from RUC forecast model output
  - Includes surface data from MADIS
  - Includes upper air data from ACARS, satellite-derived winds, and rawinsondes
- Restarts every 3 hours
- Forecasts produced out to 6—12 hours
- Runs on a Xeon dual core Dell PC using Linux
- Forecasts are available on our web site

Web Access to WRF Forecast Products

Mesonet Actual and WRF Forecast Winds
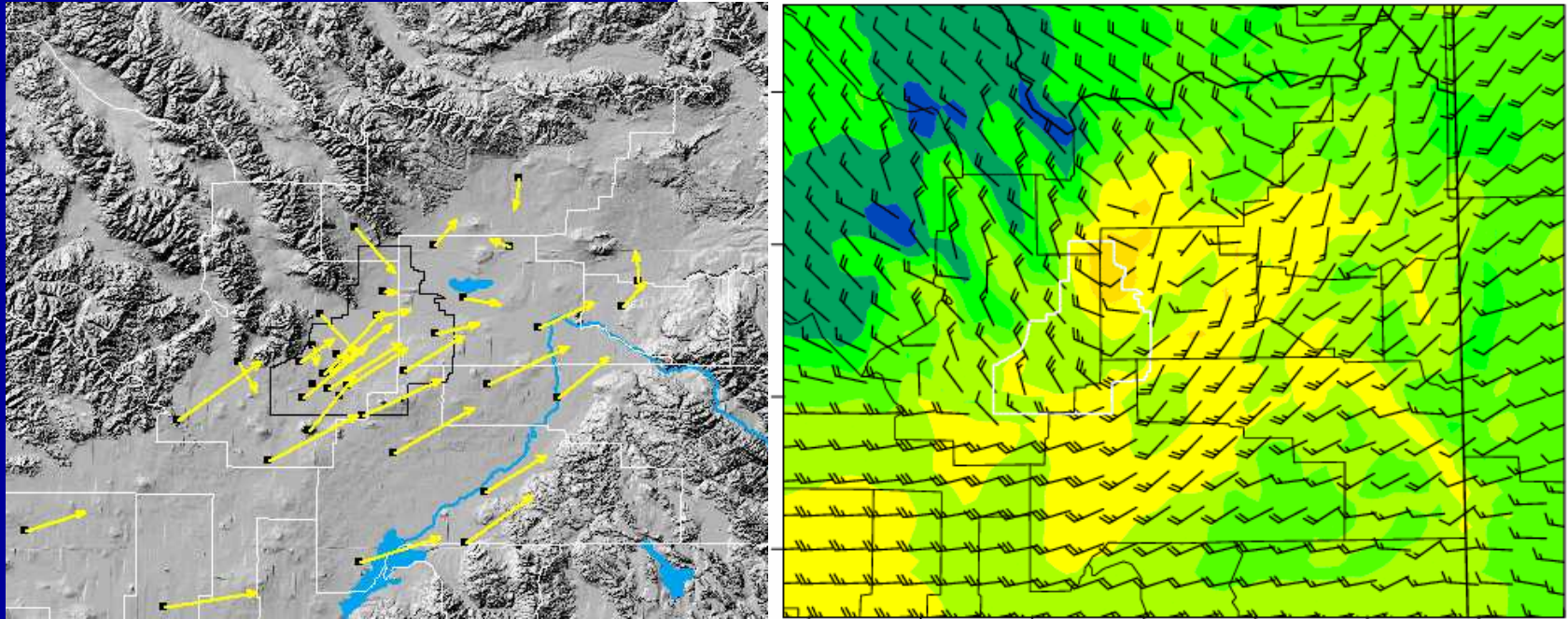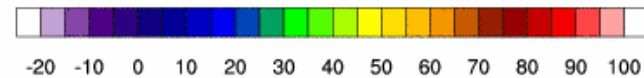
WRF Forecast High Winds
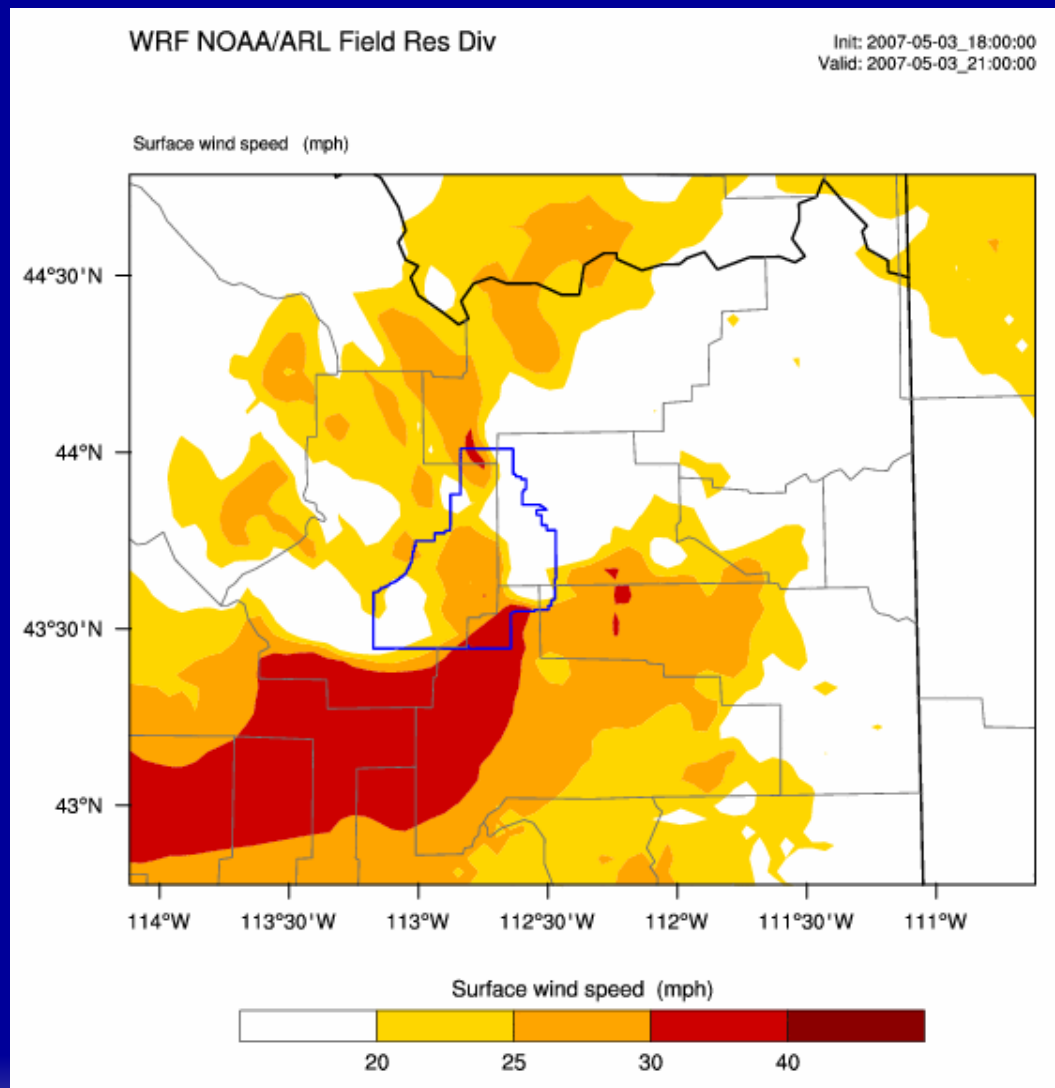
NOAA/INL Weather Center Web Page

INL Climatology

- Last printed update in 1989
  - Current statistics are available online
- New edition divides INL into 3 microclimatological zones
  - Based primarily on wind patterns
- New wind field analysis based on cluster analysis
  - 8 distinct clusters

Wind Pattern #1

Relative Frequency:
25.6 percent

Direction: NE

Speed:
Less than 10 MPH

Most Common:
Jul-Sep 0300-0900 MST
(45-66 percent)
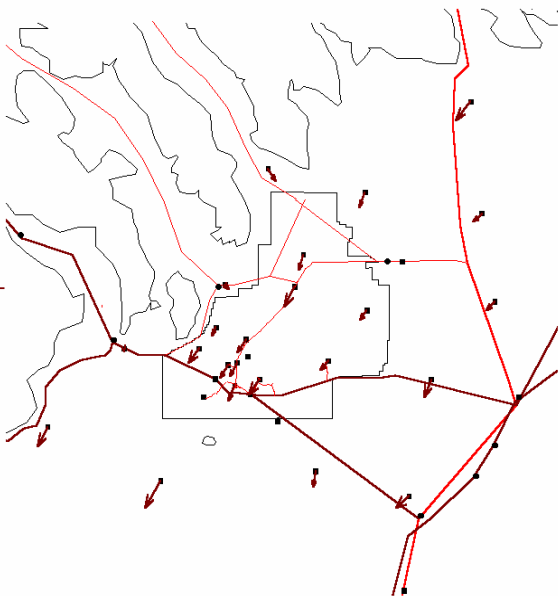
Wind Pattern #2

Relative Frequency:
24.8 percent

Direction: Variable

Speed:
Less than 8 MPH

Most Common:
Oct-Jan 0000-1000 MST
May-Aug 0000-0500 MST
(33-43 percent)
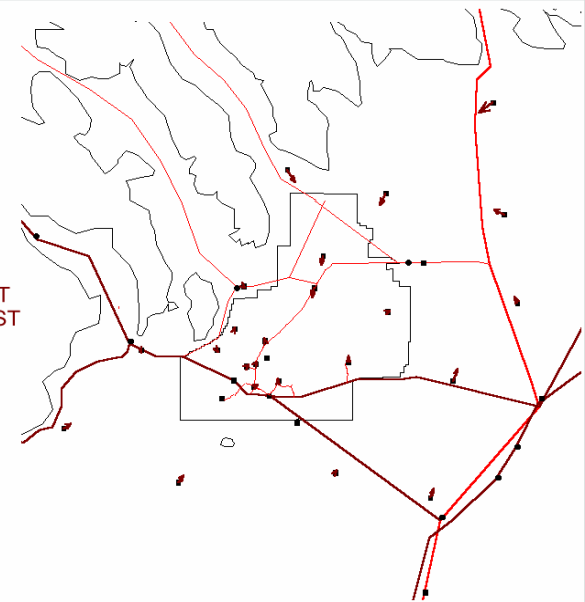
Wind Pattern #3

Relative Frequency:
13.1 percent

Direction: S-SSW

Speed: 7-11 MPH

Most Common:
Jul-Sep 1100-2100 MST
(25-39 percent)

Wind Pattern #4

Relative Frequency:
11.1 percent

North Group

Direction: Variable
Speed: 6-11 MPH

Others

Direction: SW
Speed: 12-16 MPH

Most Common:
Jan-Feb 1500-2100 MST
Apr-Jun 1800-2200 MST
(15-22 percent)

Wind Pattern #5
Relative Frequency:
8.9 percent

Direction: SSW

Speed: 11-18 MPH

Most Common:
May-Sep 1300-1800 MST
(23-29 percent)

Wind Pattern #6
Relative Frequency:
6.7 percent

North Group

Direction: N-NW
Speed: 10-20 MPH

Others

Direction: W-NW
Speed: 5-15 MPH

Most Common:
Apr 2200-0400 MST
Oct 1600-2400 MST
(13-18 percent)

Wind Pattern #7
Relative Frequency:
5.2 percent

Direction: SW

Speed: 15-30 MPH

Most Common:
Mar-Aug 1400-1800 MST
(15-25 percent)

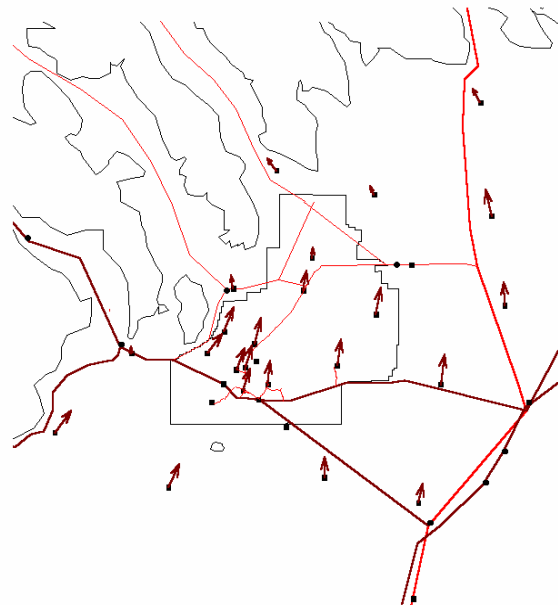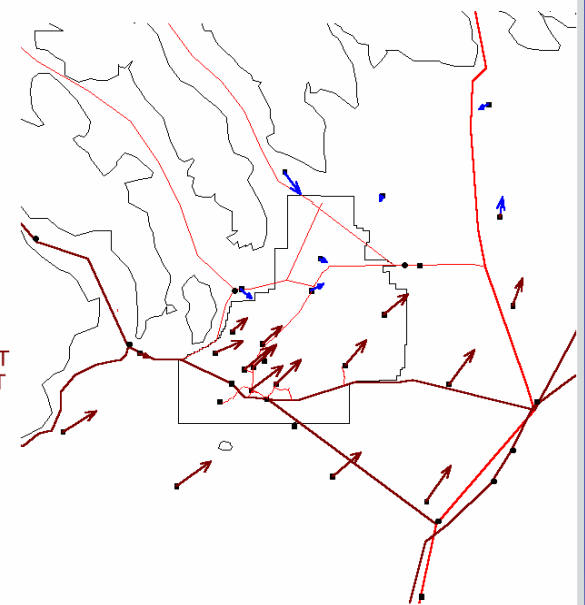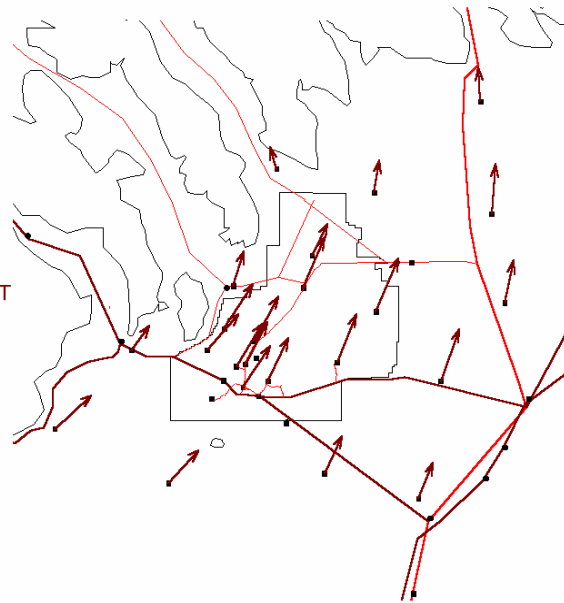**Wind Pattern #8**
Relative Frequency:
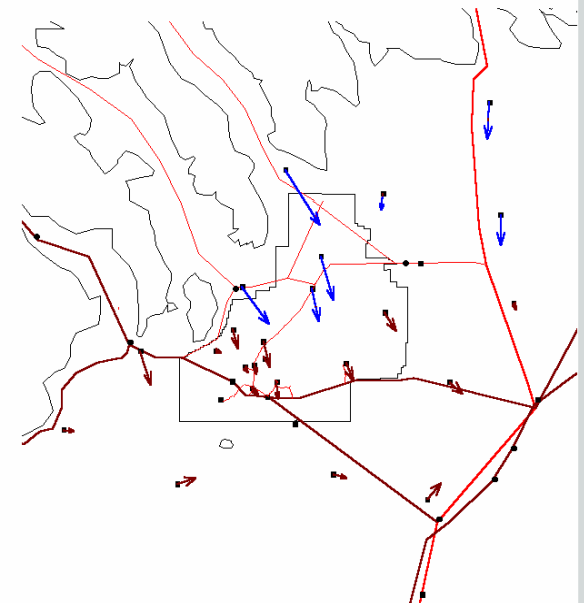4.7 percent

Direction: N-NNE

Speed: 10-20 MPH

Most Common:
Apr 1700-1200 MST
Oct 2200-0100 MST
(9-12 percent)
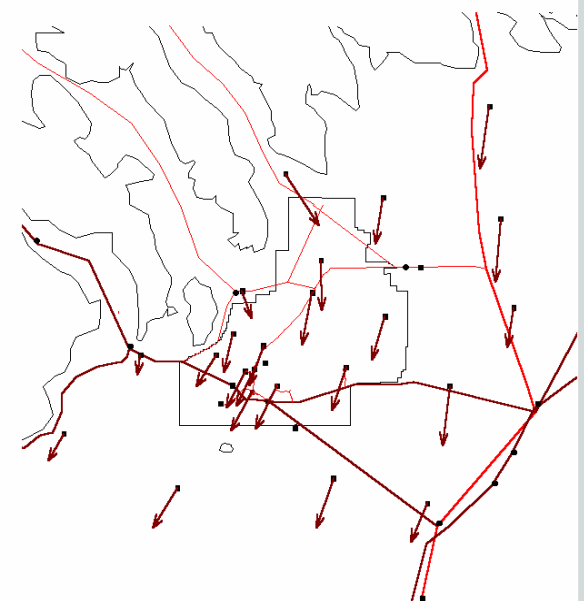
Monthly & Hourly Cluster Frequencies
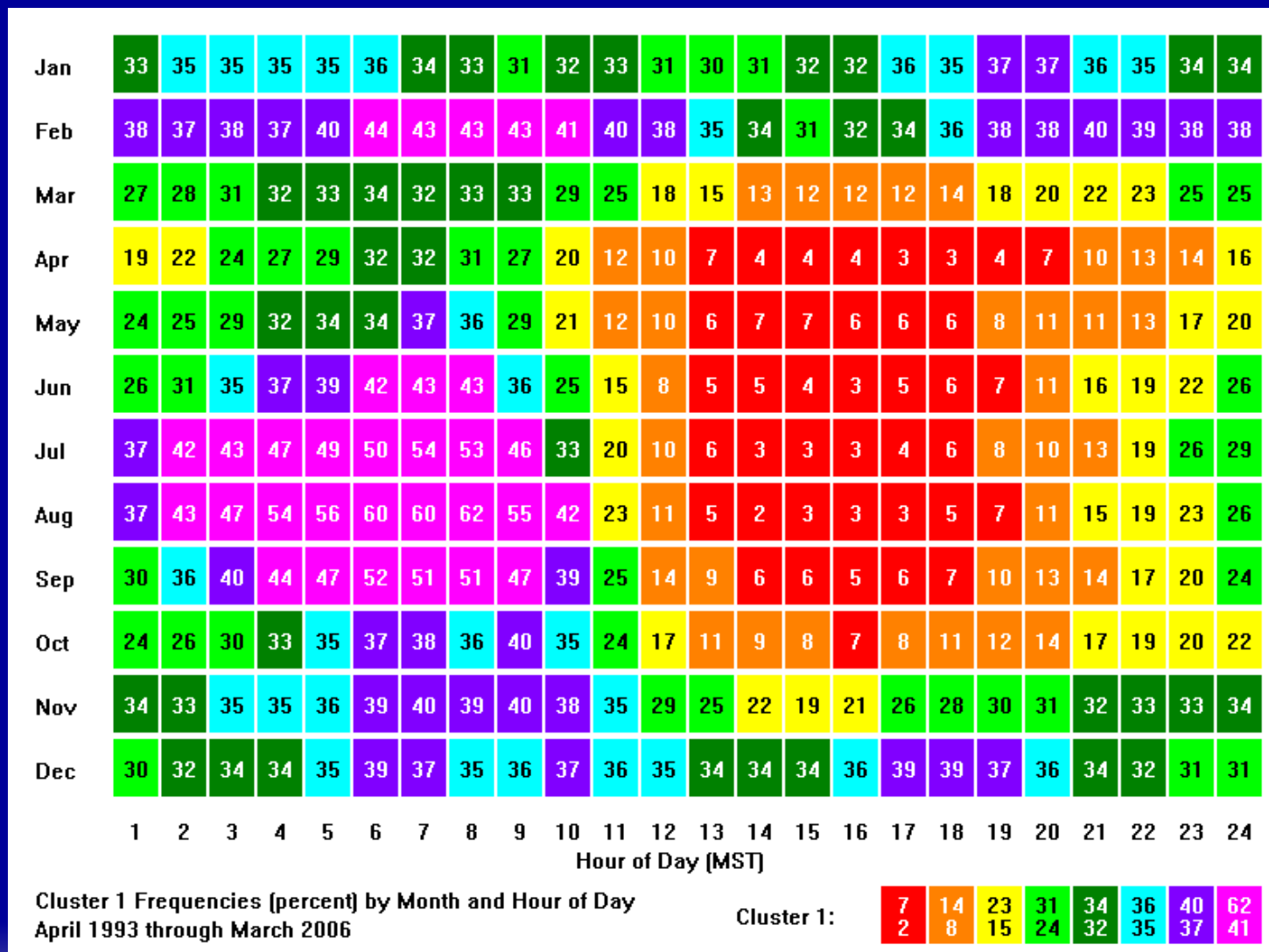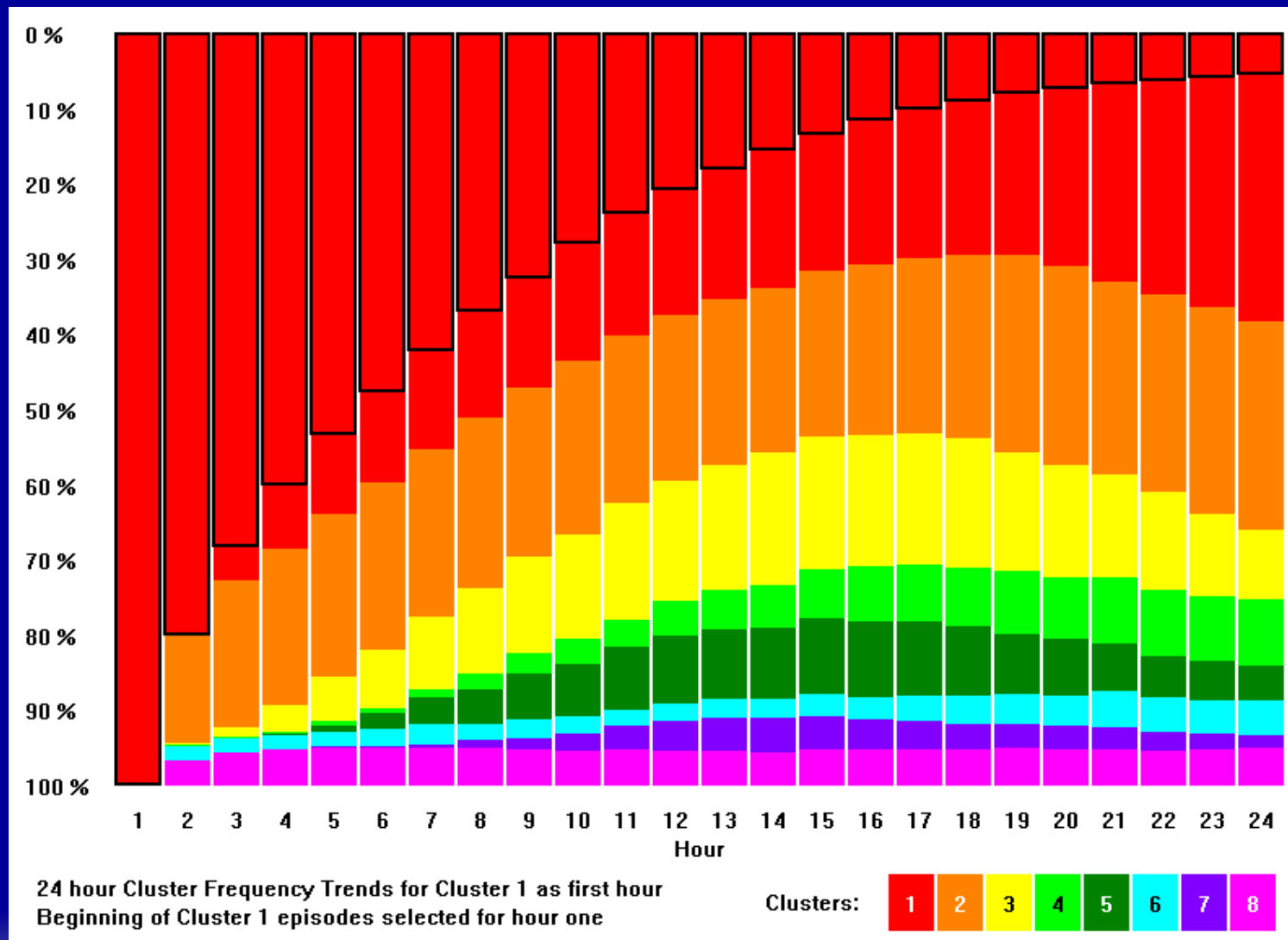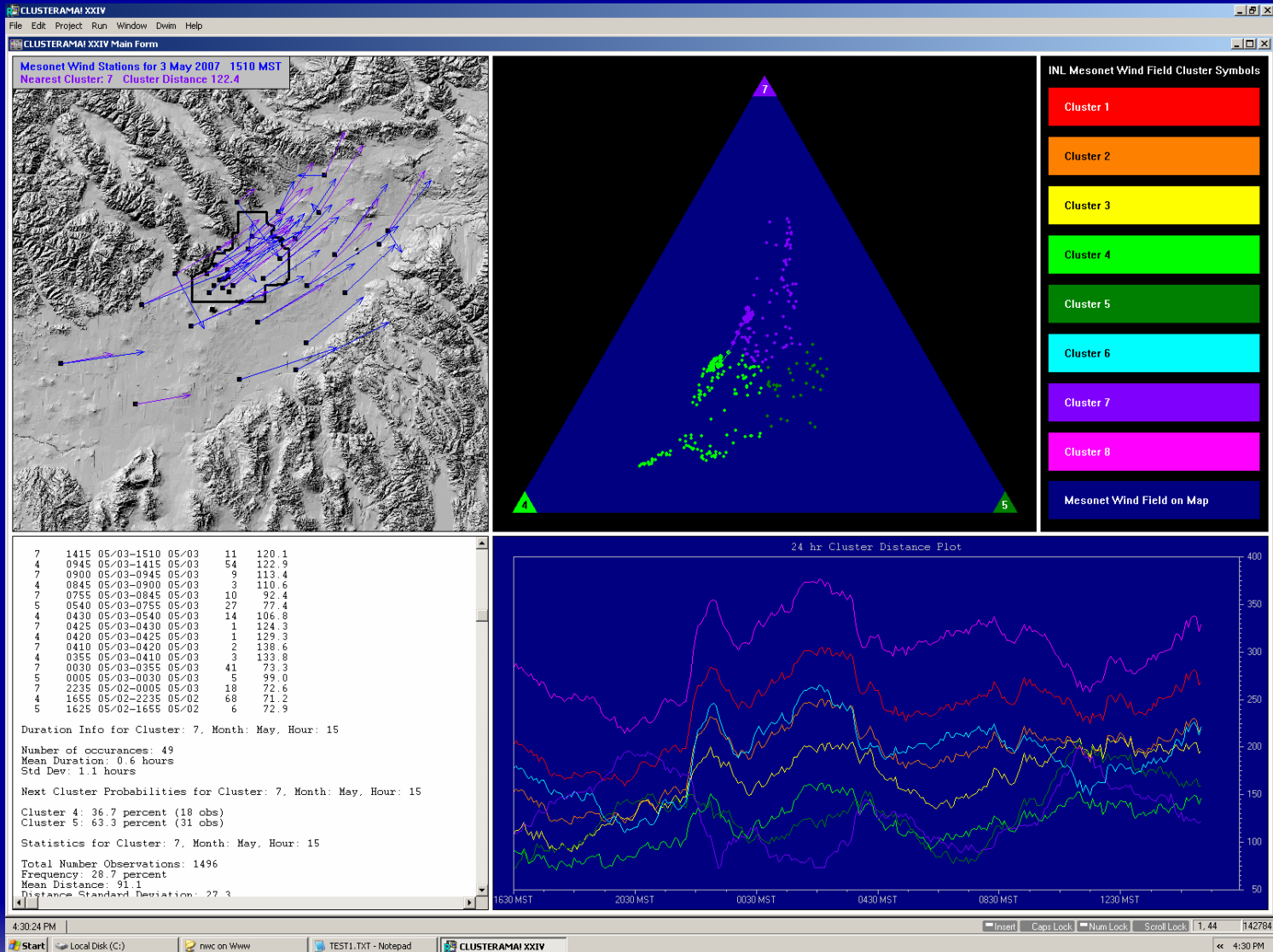
Cluster 1 Frequencies (percent) by Month and Hour of Day
April 1993 through March 2006

24-hour Cluster Frequency Trends

24 hour Cluster Frequency Trends for Cluster 1 as first hour
Beginning of Cluster 1 episodes selected for hour one

Clusters: 1 2 3 4 5 6 7 8

Analysis and Forecast Tool

Analysis and Forecast Tool

Mesonet Wind Stations for 3 May 2007 1510 MST
Nearest Cluster: 7   Cluster Distance 122.4

Analysis and Forecast Tool

Analysis and Forecast Tool

24 hr Cluster Distance Plot
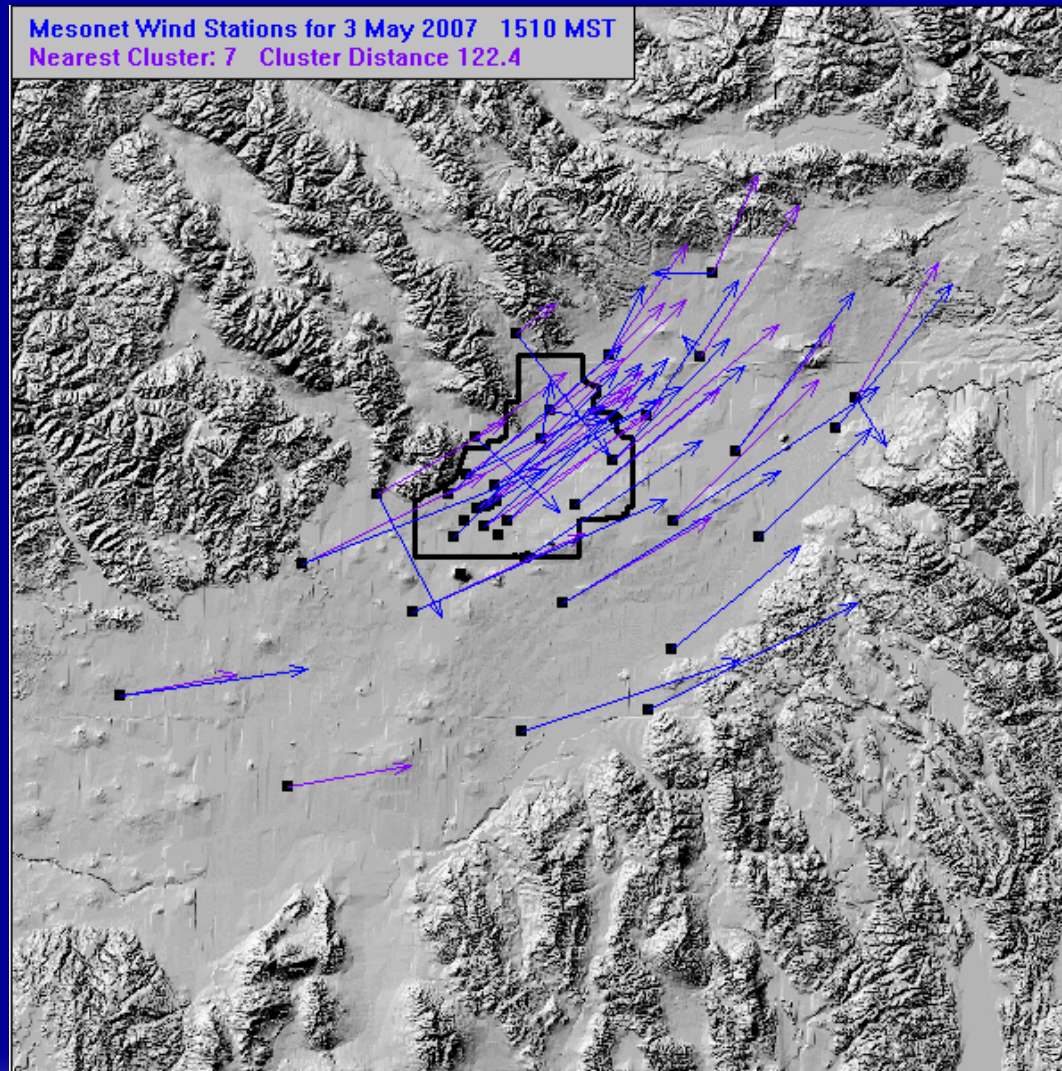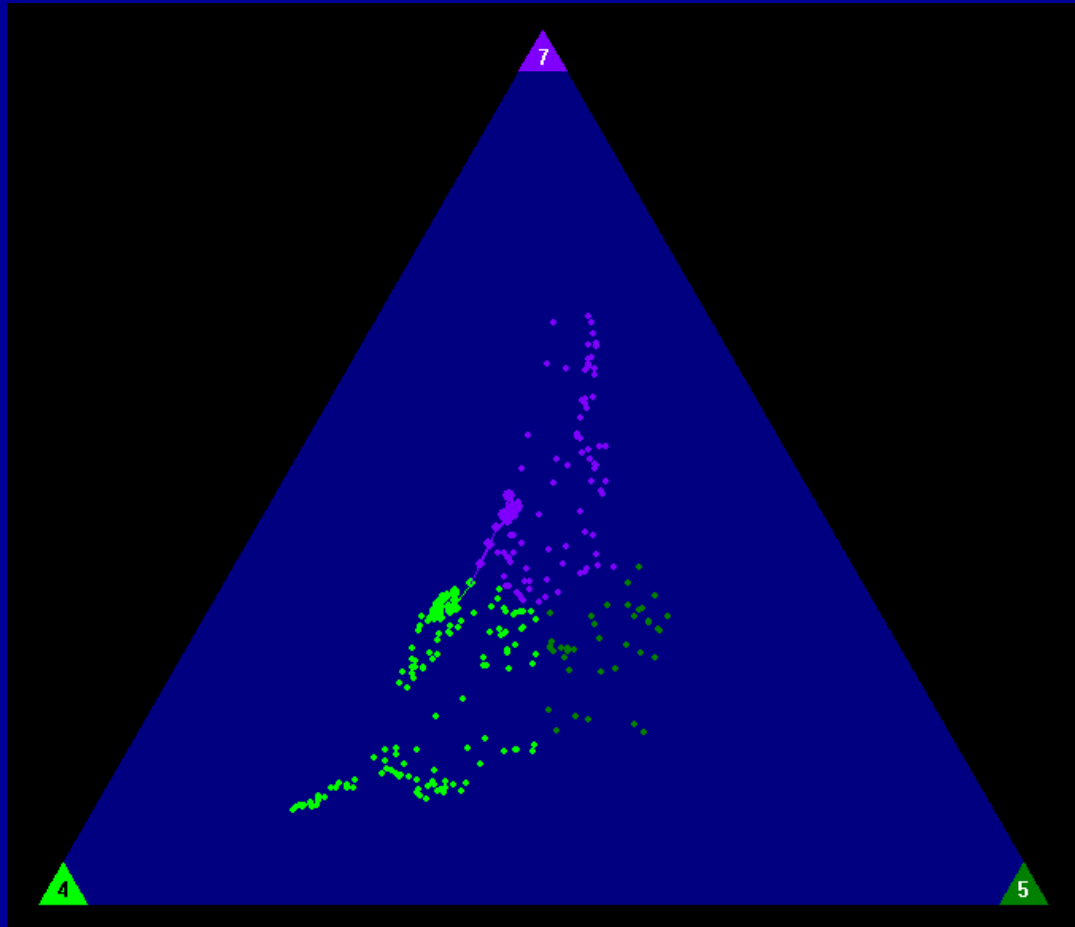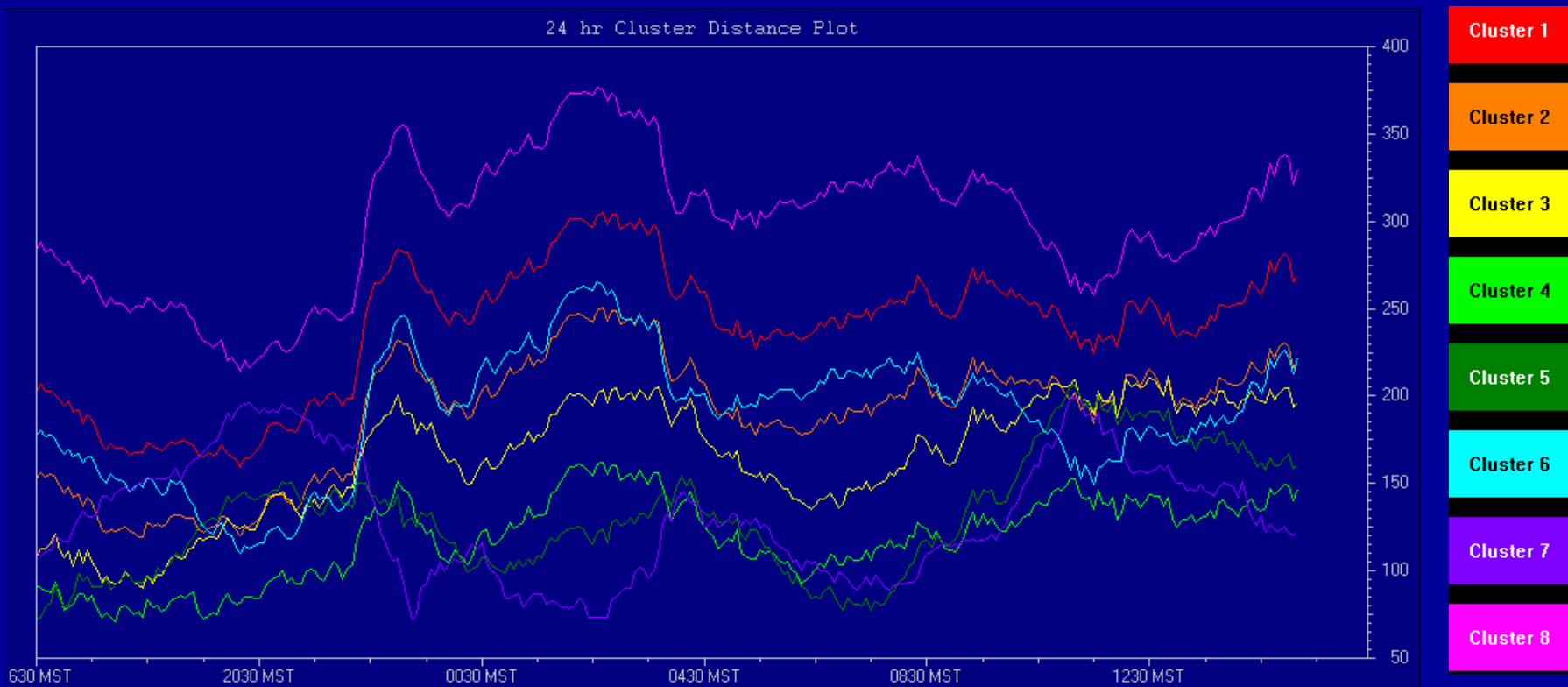
Analysis and Forecast Tool

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7      1415  05/03-1510  05/03     11    120.1
4      0945  05/03-1415  05/03     54    122.9
7      0900  05/03-0945  05/03      9    113.4
4      0845  05/03-0900  05/03      3    110.6
7      0755  05/03-0845  05/03     10     92.4
5      0540  05/03-0755  05/03     27     77.4
4      0430  05/03-0540  05/03     14    106.8
7      0425  05/03-0430  05/03      1    124.3
4      0420  05/03-0425  05/03      1    129.3
7      0410  05/03-0420  05/03      2    138.6
4      0355  05/03-0410  05/03      3    133.8
7      0030  05/03-0355  05/03     41     73.3
5      0005  05/03-0030  05/03      5     99.0
7      2235  05/02-0005  05/03     18     72.6
4      1655  05/02-2235  05/02     68     71.2
5      1625  05/02-1655  05/02      6     72.9
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Duration Info for Cluster: 7, Month: May, Hour: 15

Number of occurances: 49
Mean Duration: 0.6 hours
Std Dev: 1.1 hours

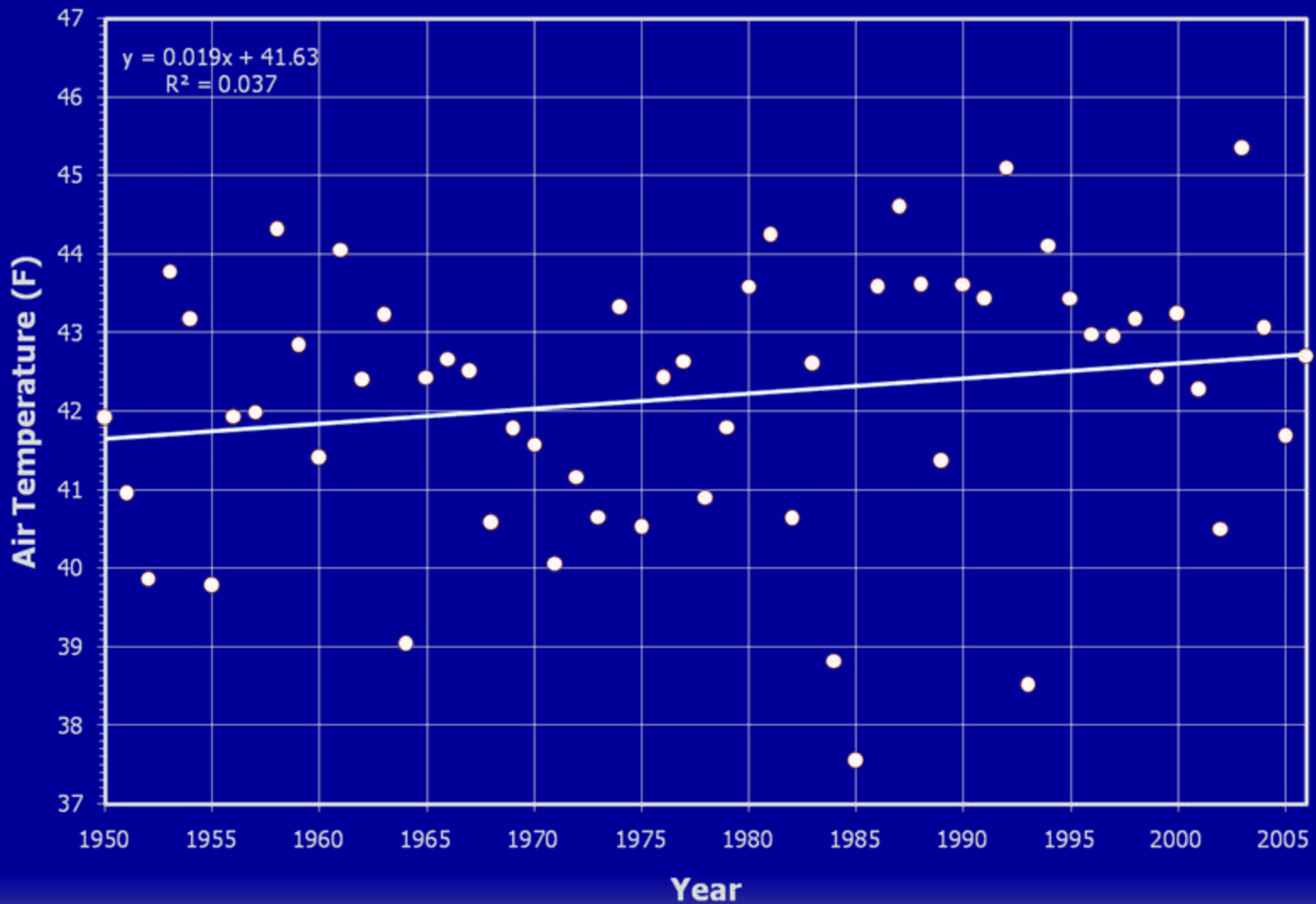Next Cluster Probabilities for Cluster: 7, Month: May, Hour: 15

Cluster 4: 36.7 percent (18 obs)
Cluster 5: 63.3 percent (31 obs)
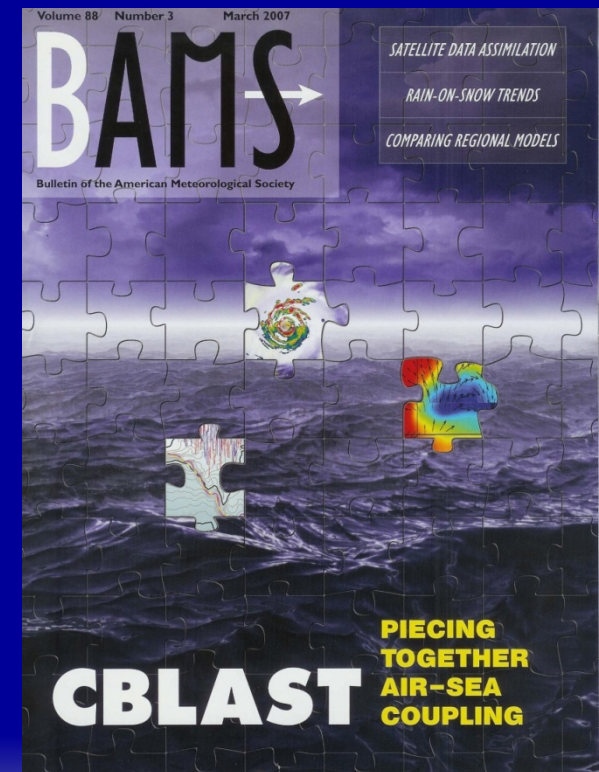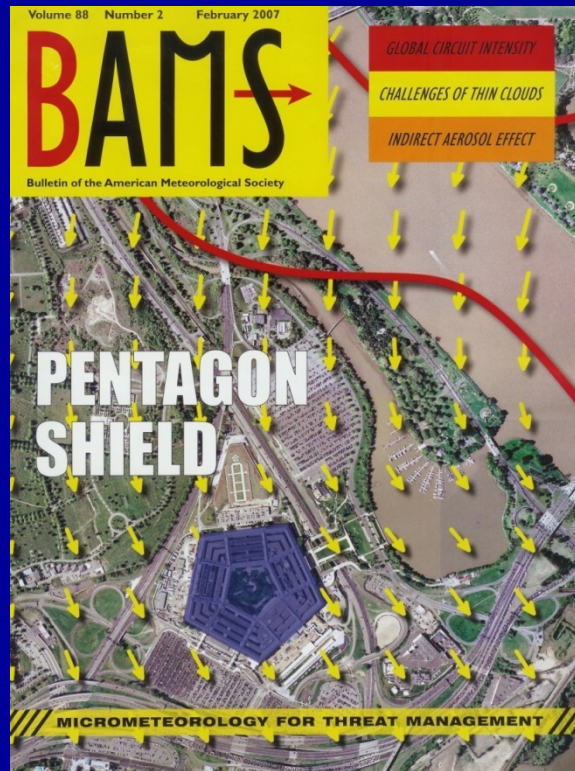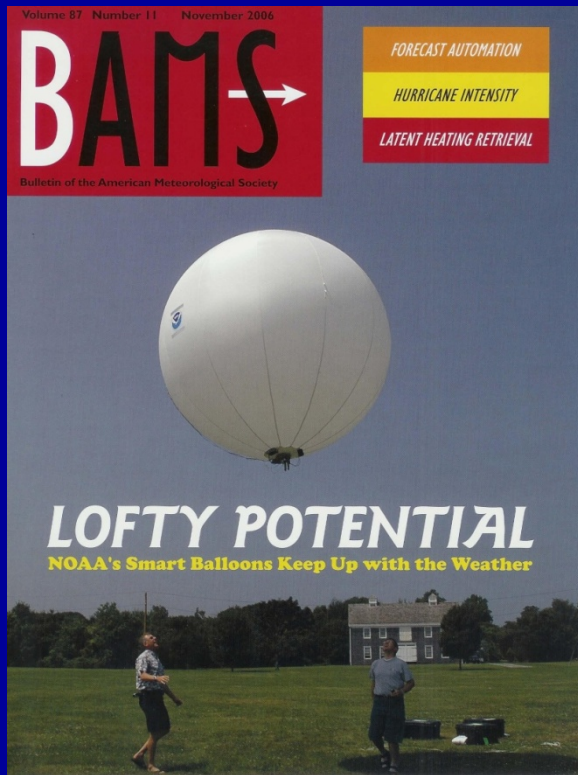
Statistics for Cluster: 7, Month: May, Hour: 15

Total Number Observations: 1496
Frequency: 28.7 percent
Mean Distance: 91.1
Distance Standard Deviation: 27.2

INL Air Temperature Trend

FRD Research Featured in BAMS

3 covers in 5 months!