

Stationary Front Experiment

Richard McNider

Arastoo Pour Biazar

University of Alabama in Huntsville

Max Shauck

Sergio Alvarez

Baylor University

Martin Buhr

Air Quality Design, Inc.

Jay Olaguer

HARC

Conceptual model presented by McNider et al., 2005: Conceptual Model for Extreme Ozone Concentration Events in Dallas and East Texas Based on Reduced Dilution in Frontal Zones

High ozone events during 1999 were associated with stationary front

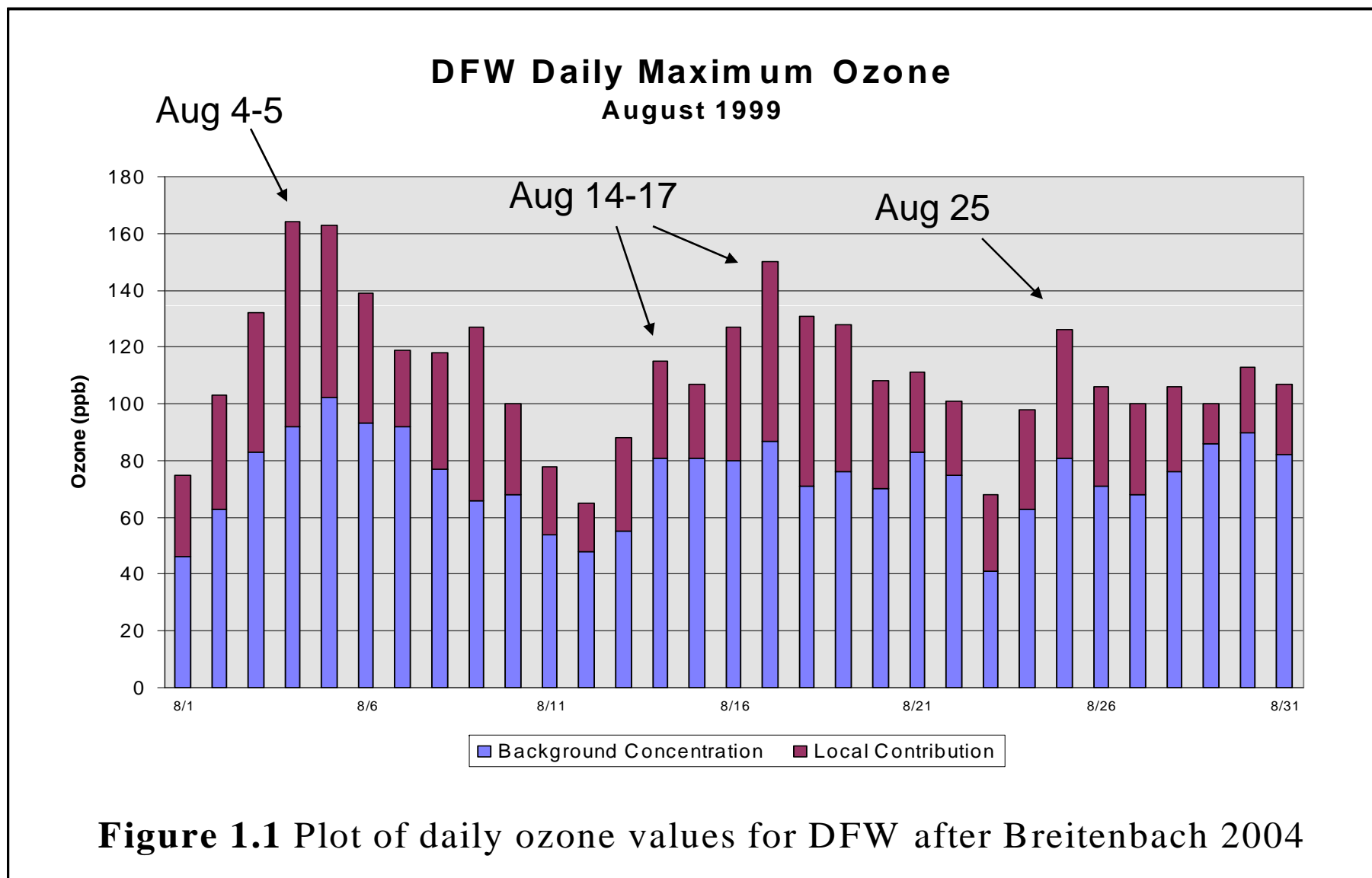
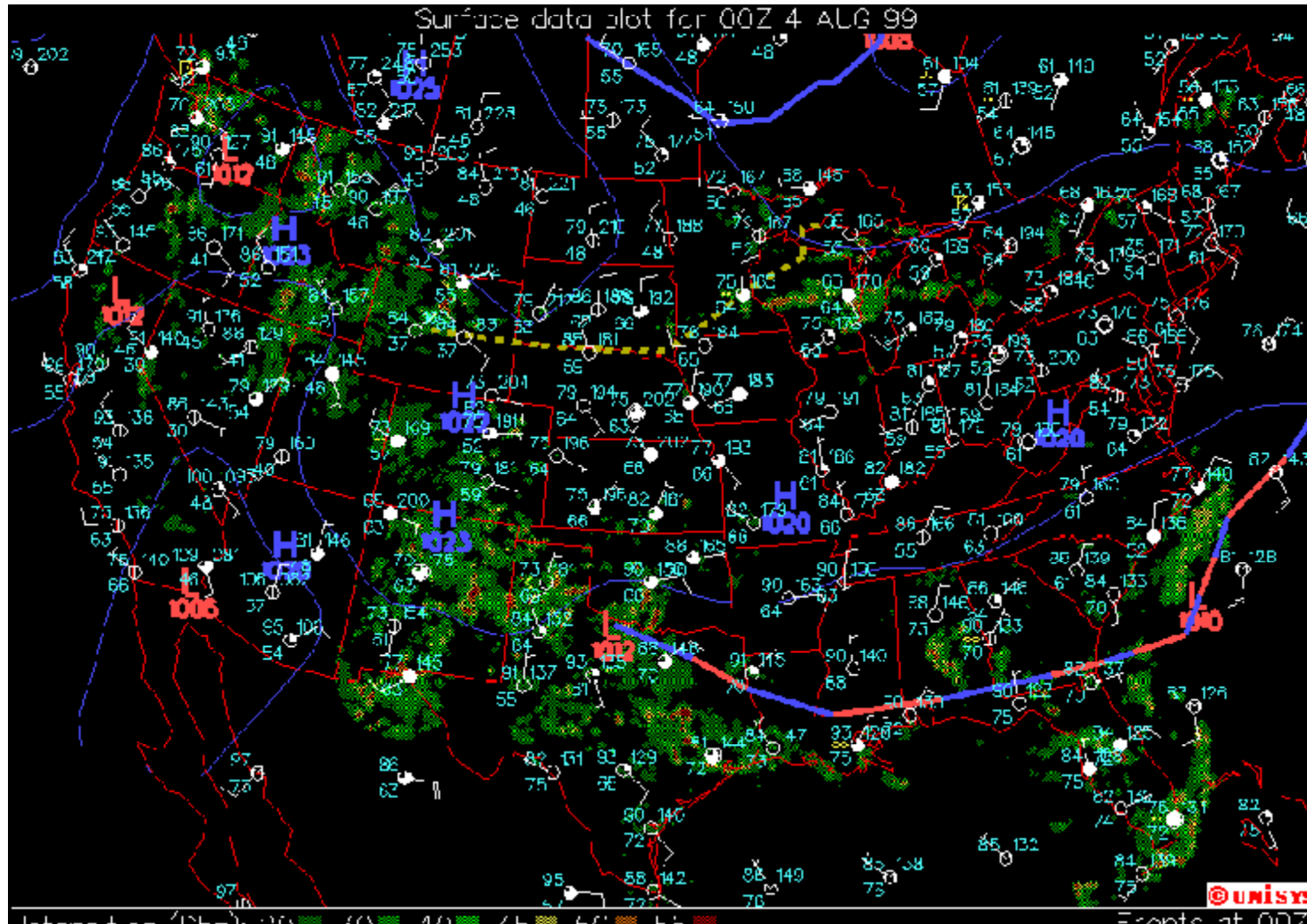
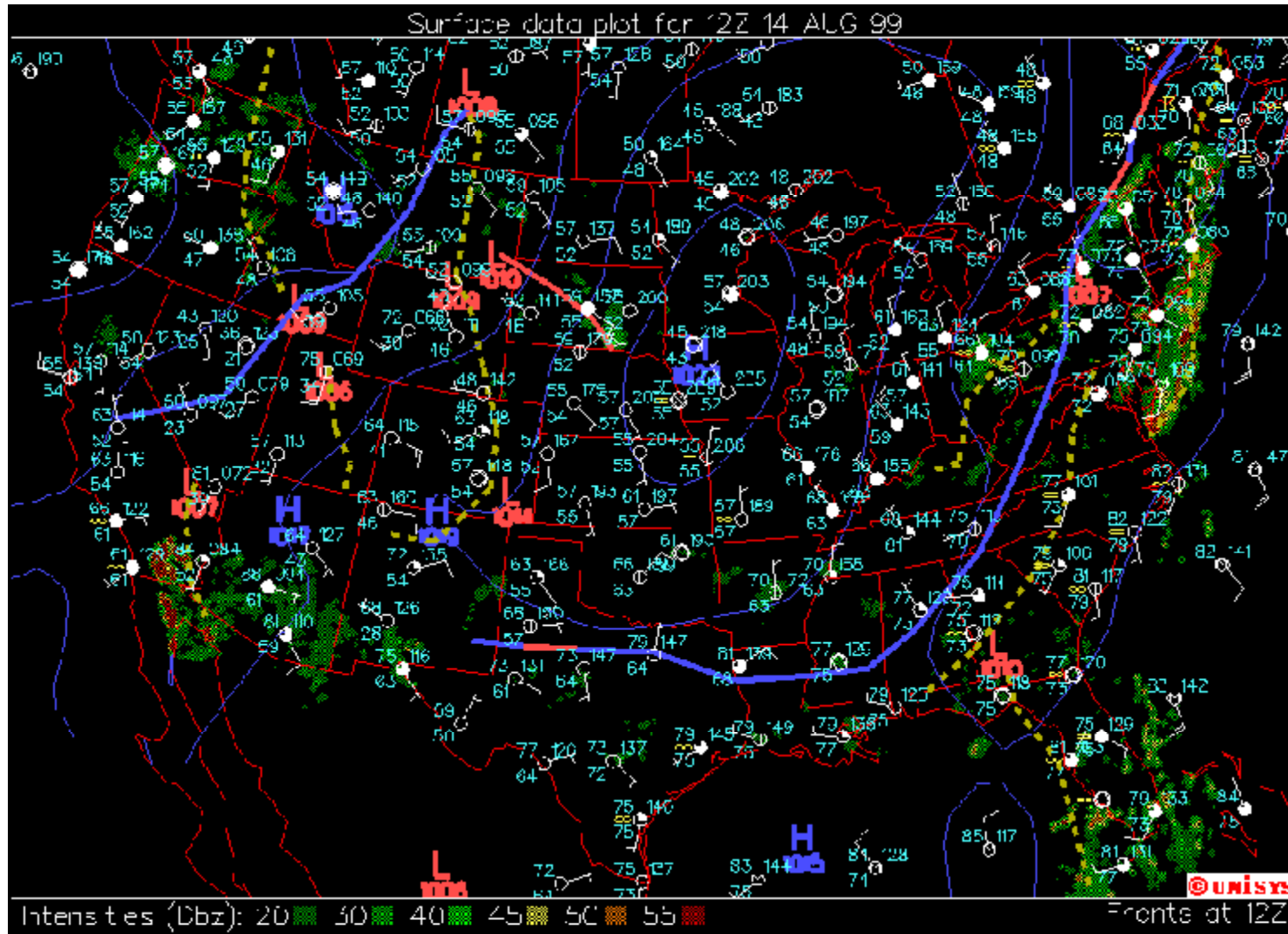


Figure 1.1 Plot of daily ozone values for DFW after Breitenbach 2004

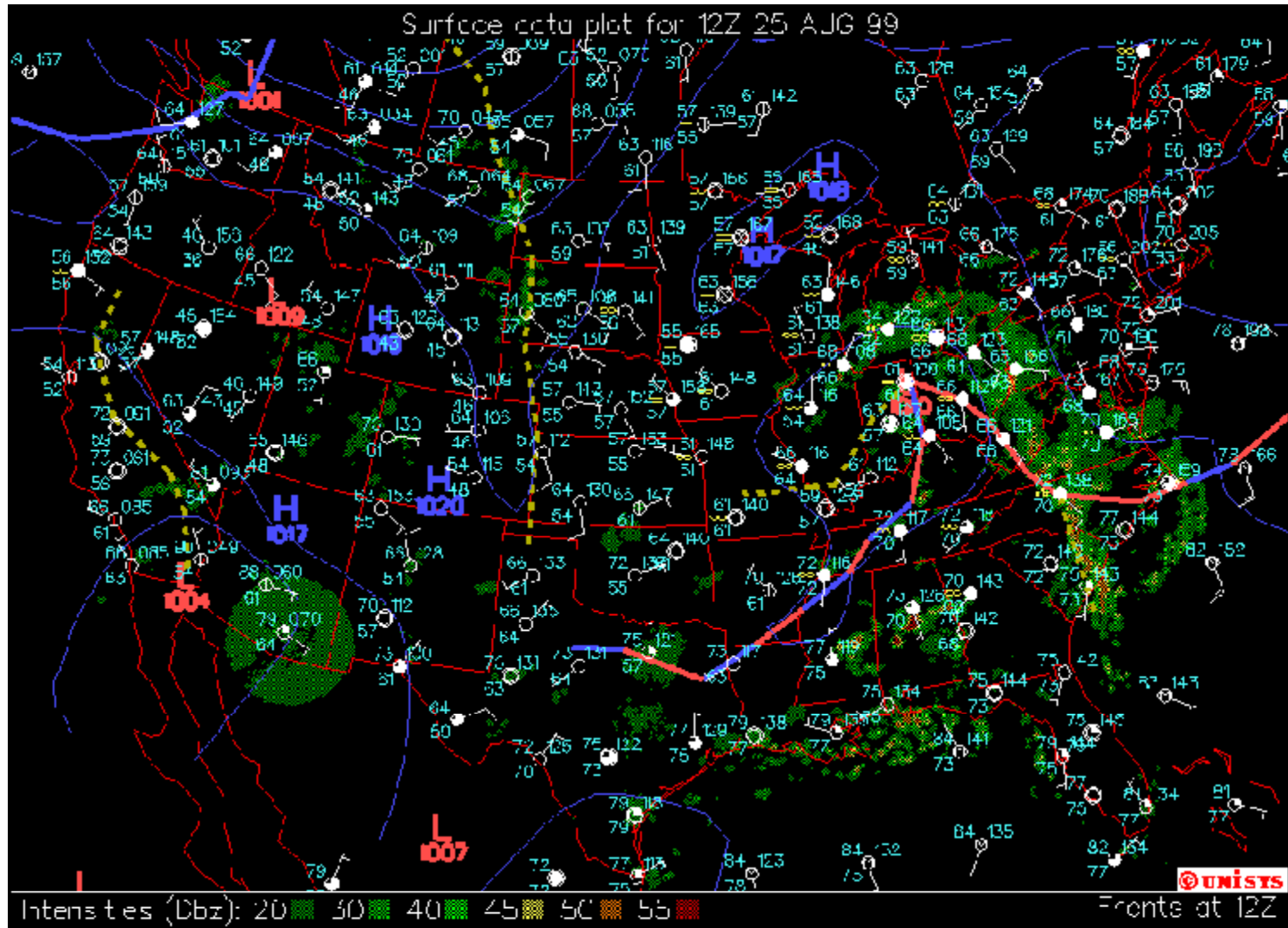
August 4, 1999



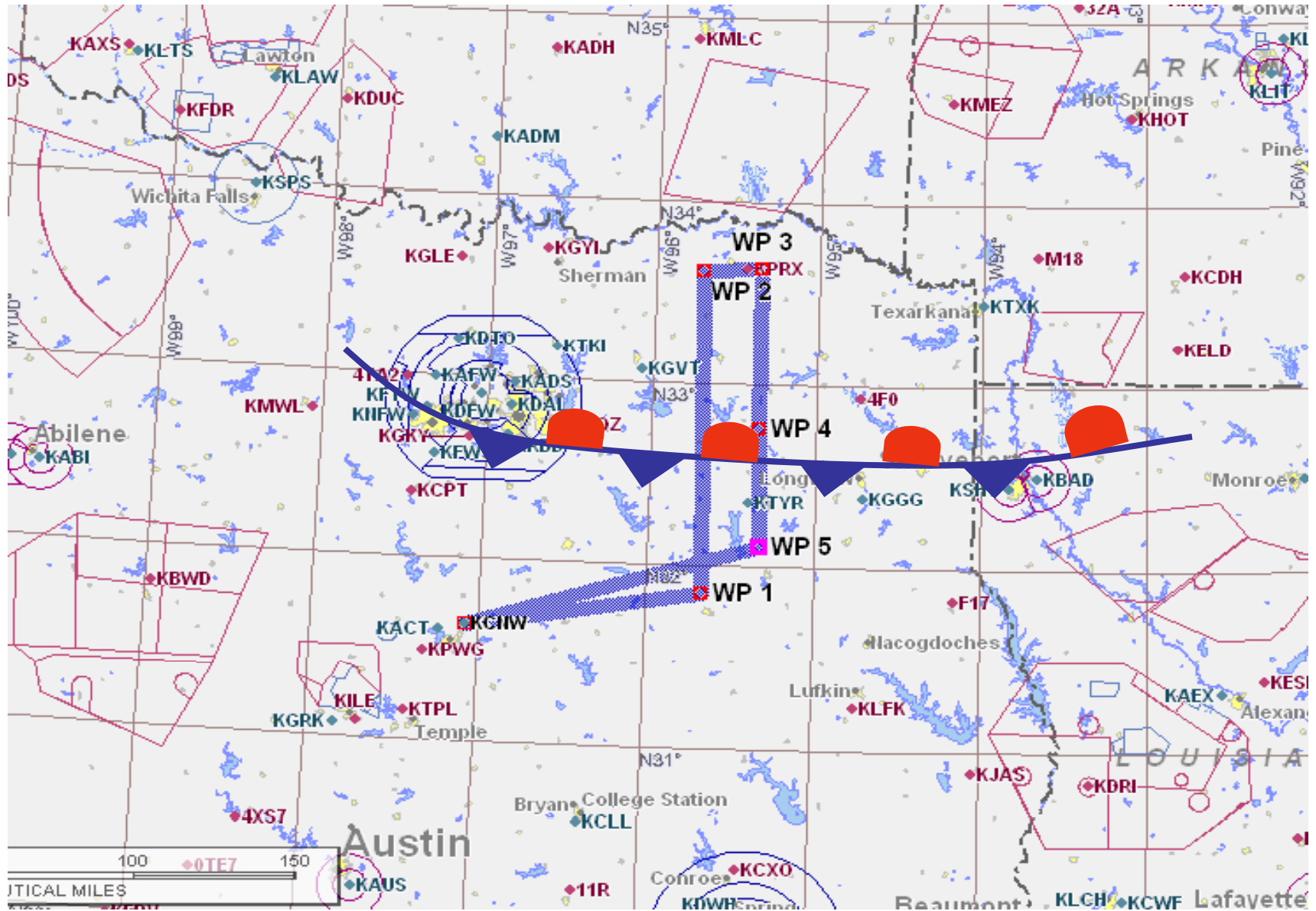
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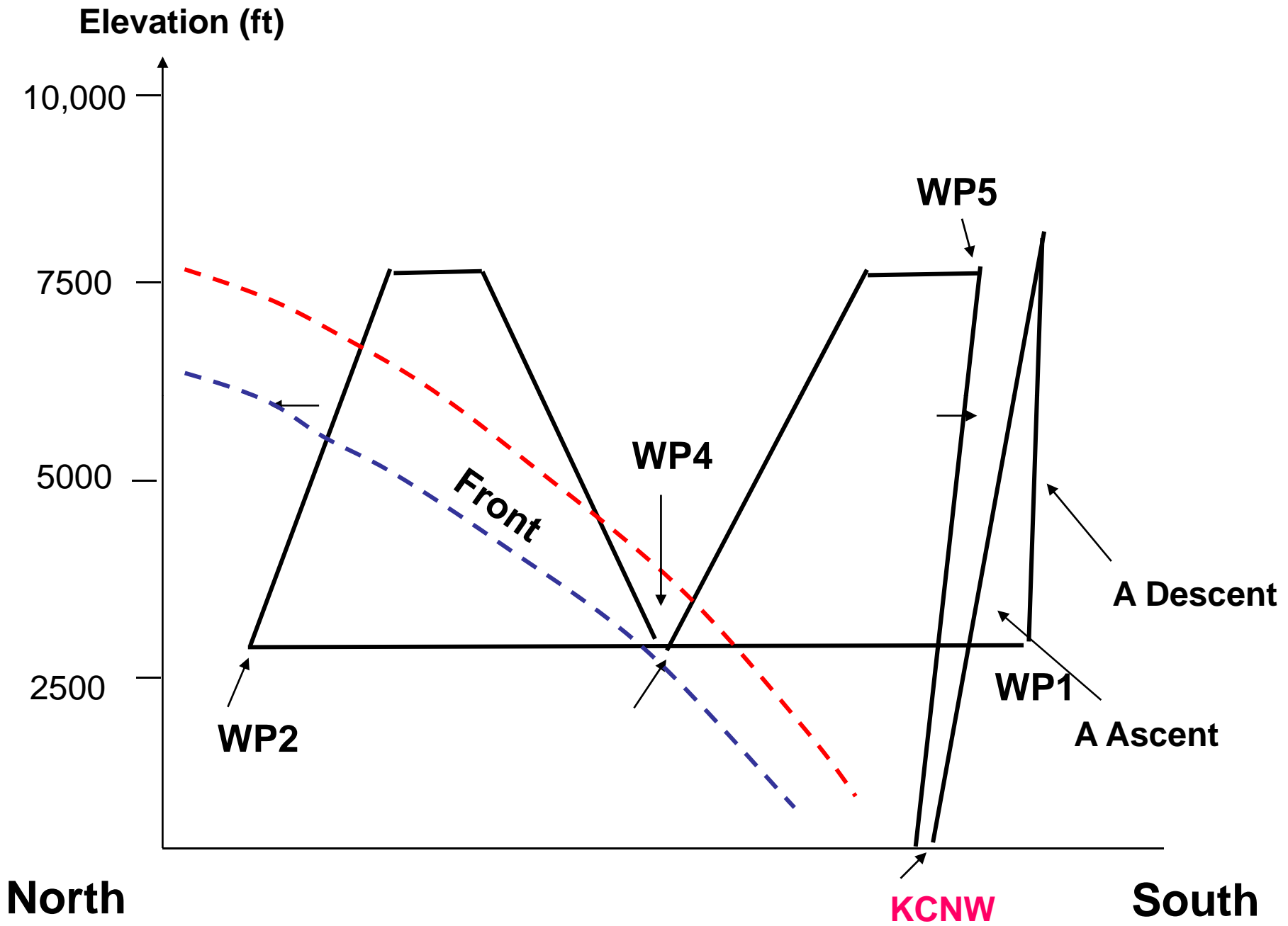


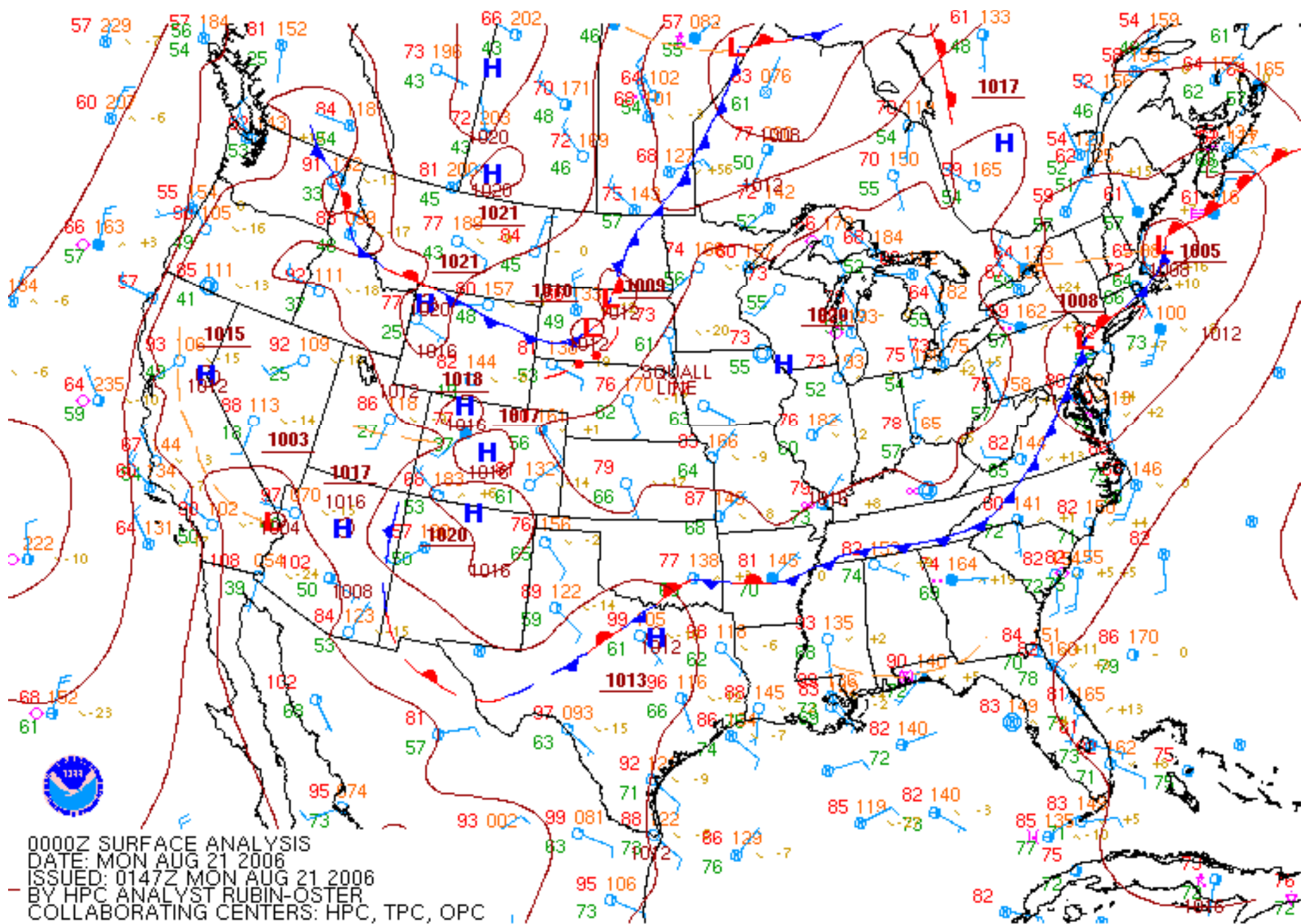
August 25, 1999



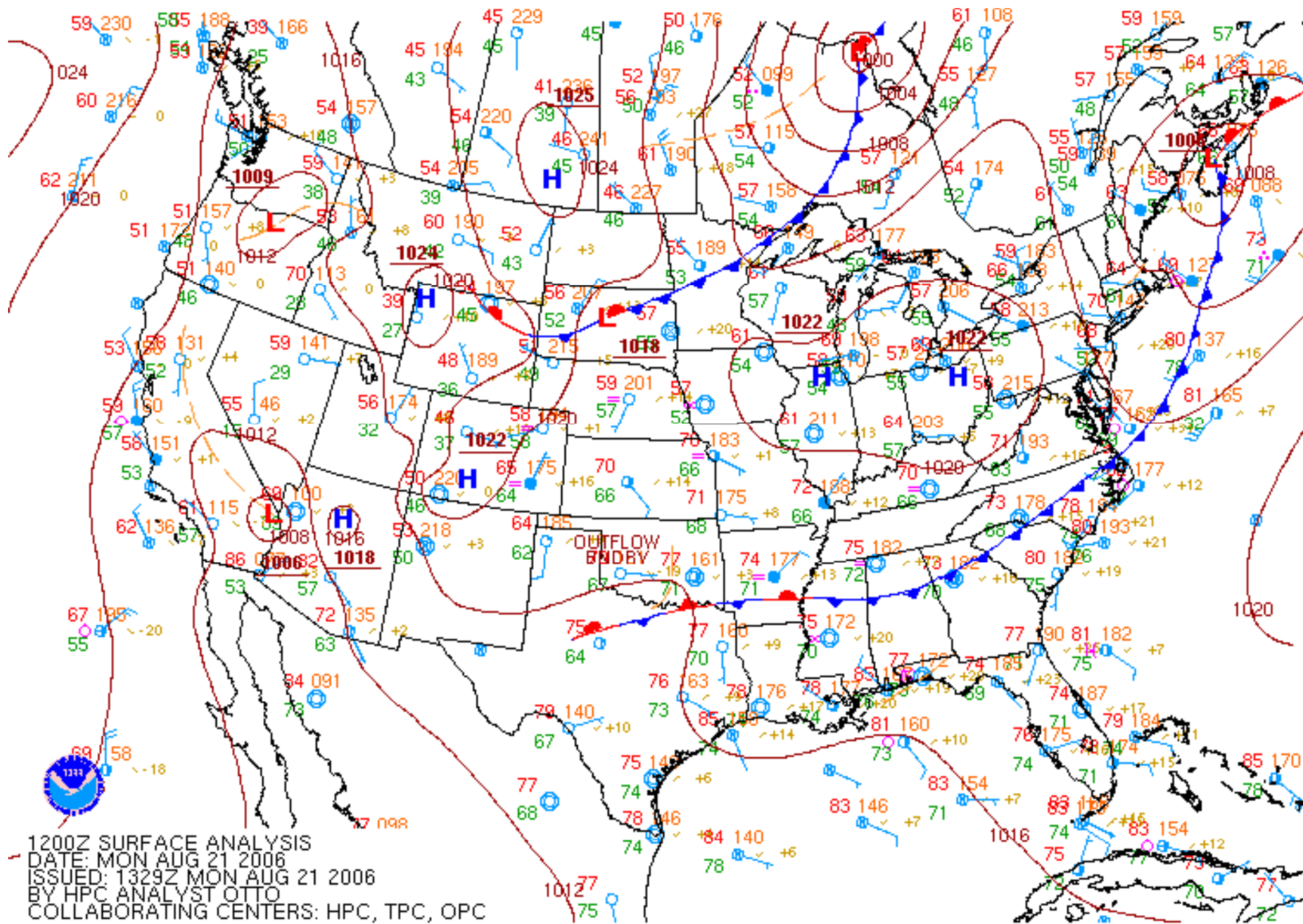
Strawman Flight Plan for Dallas

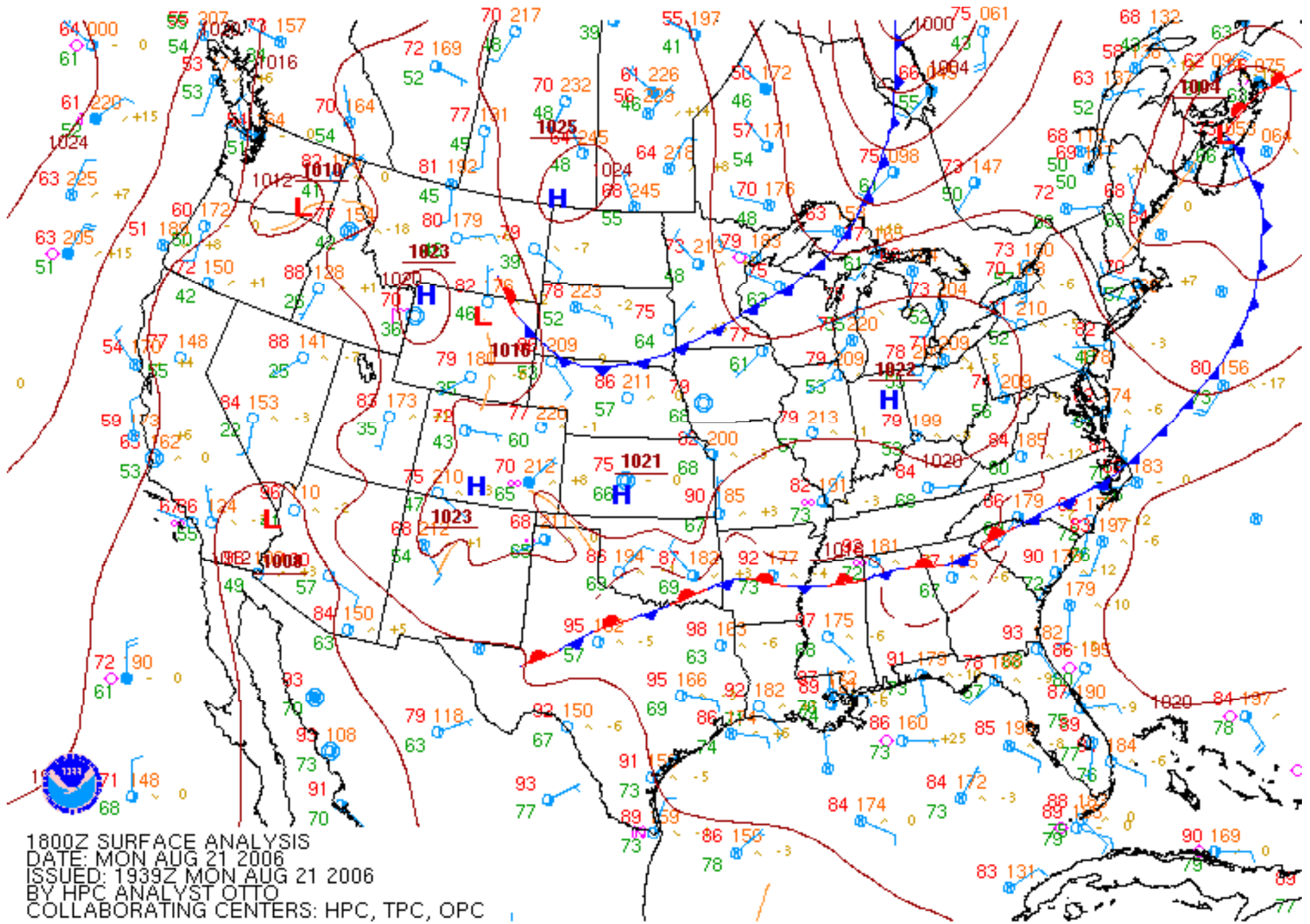


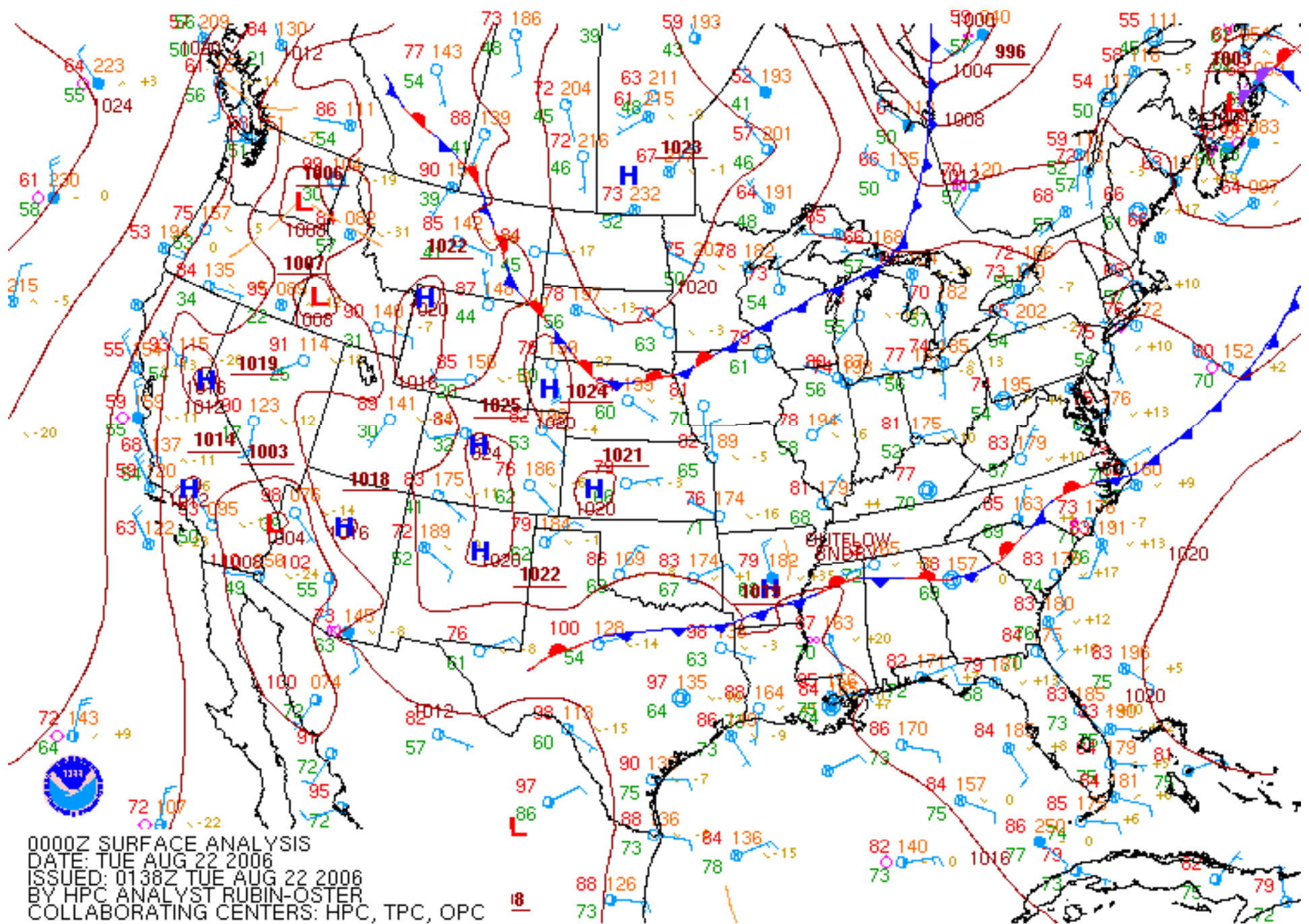




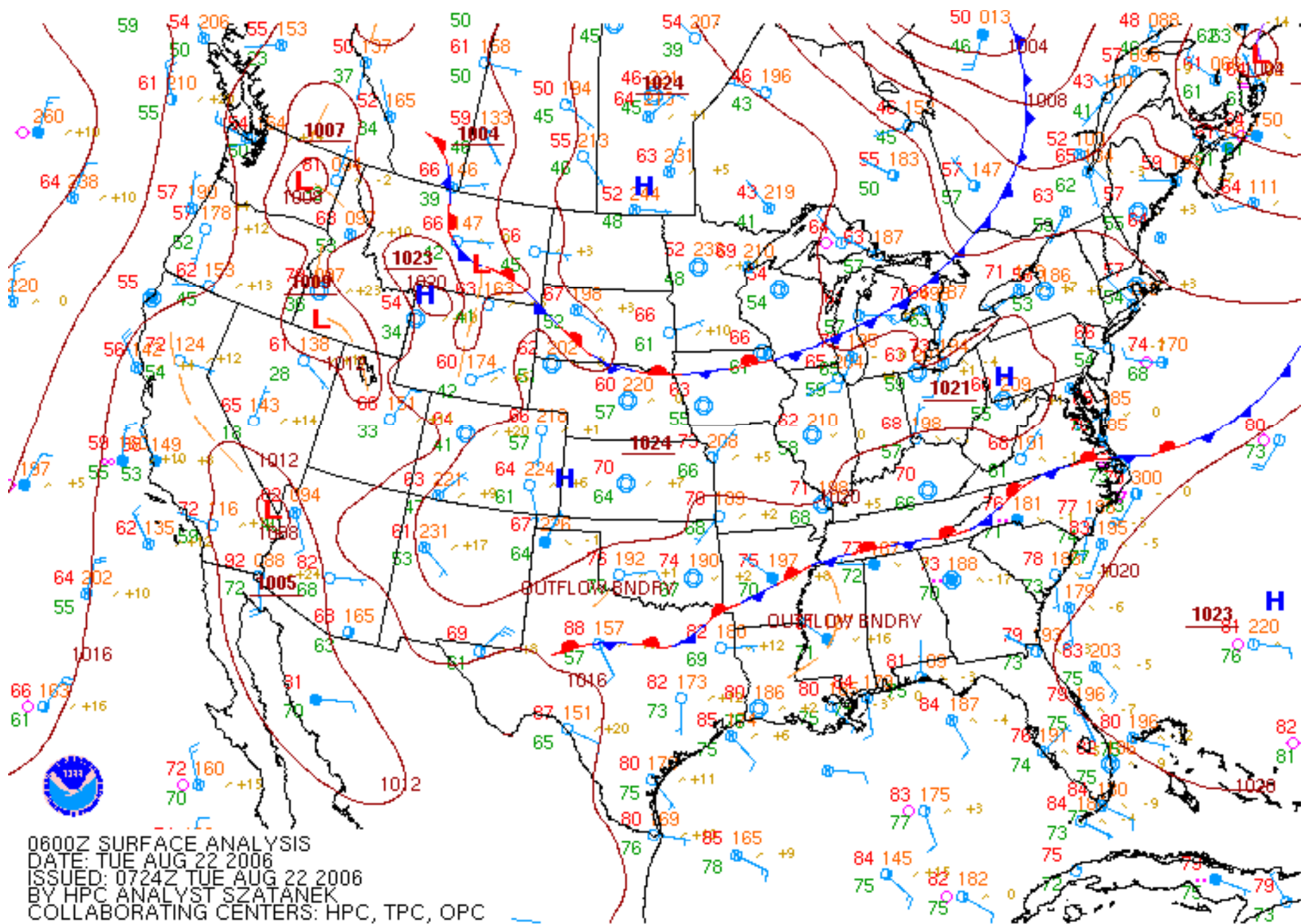
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 ISSUED: 0147Z MON AUG 21 2006
 BY HPC ANALYST RUBIN-OSTER
 COLLABORATING CENTERS: HPC, TPC, OPC



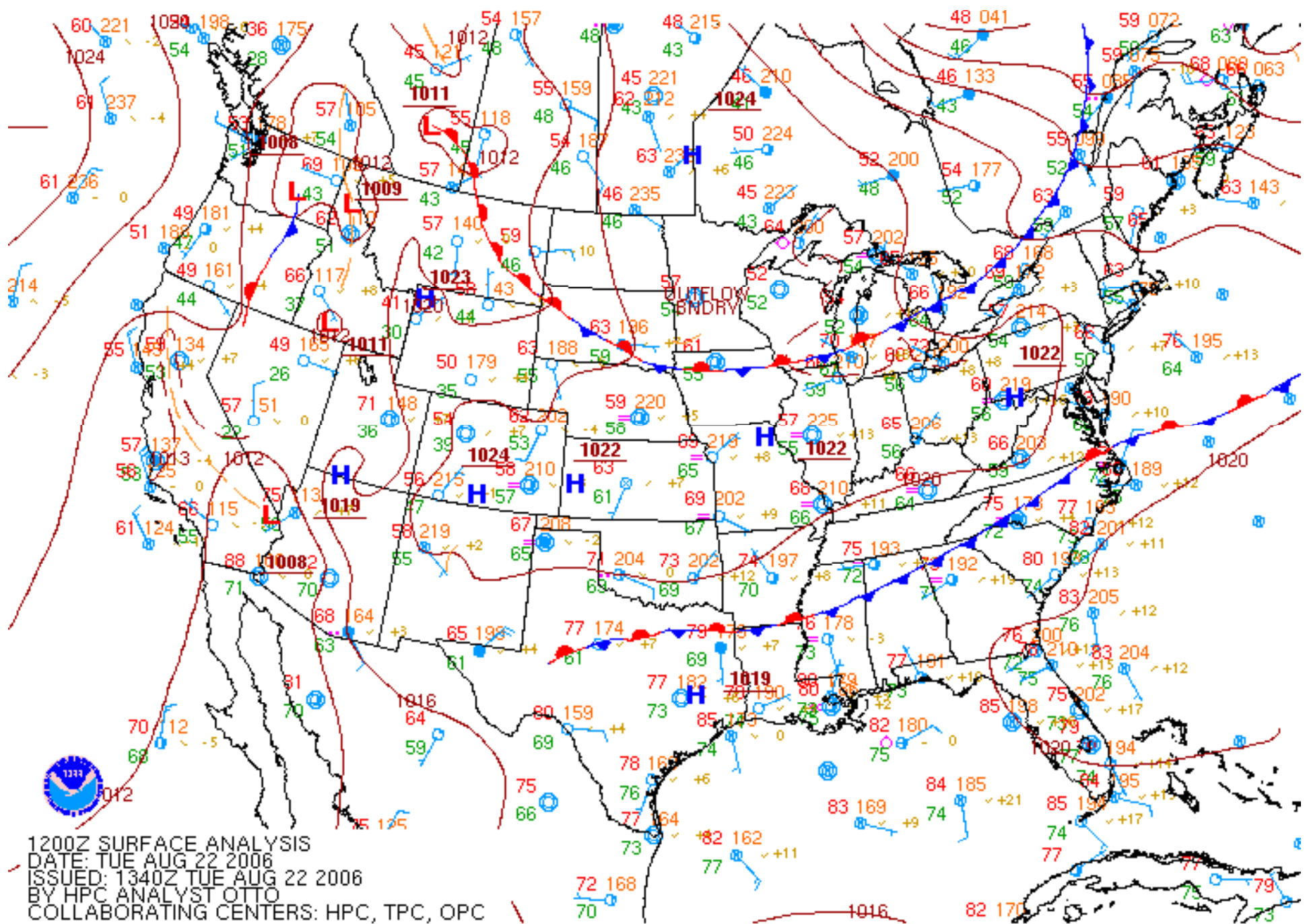




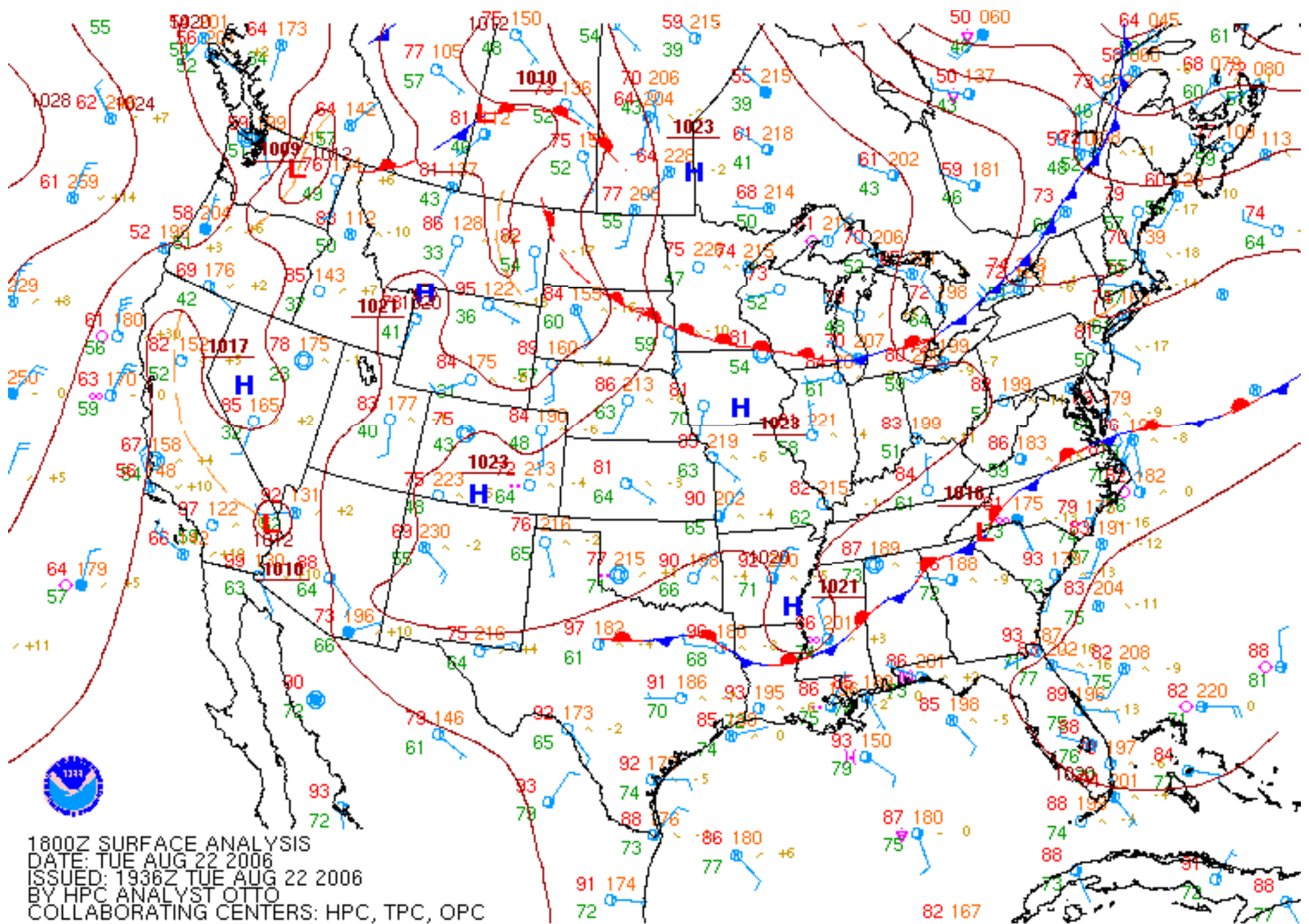
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 ISSUED: 0138Z TUE AUG 22 2006
 BY HPC ANALYST RUBIN-OSTER
 COLLABORATING CENTERS: HPC, TPC, OPC



0600Z SURFACE ANALYSIS
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 BY HPC ANALYST SZATANEK
 COLLABORATING CENTERS: HPC, TPC, OPC

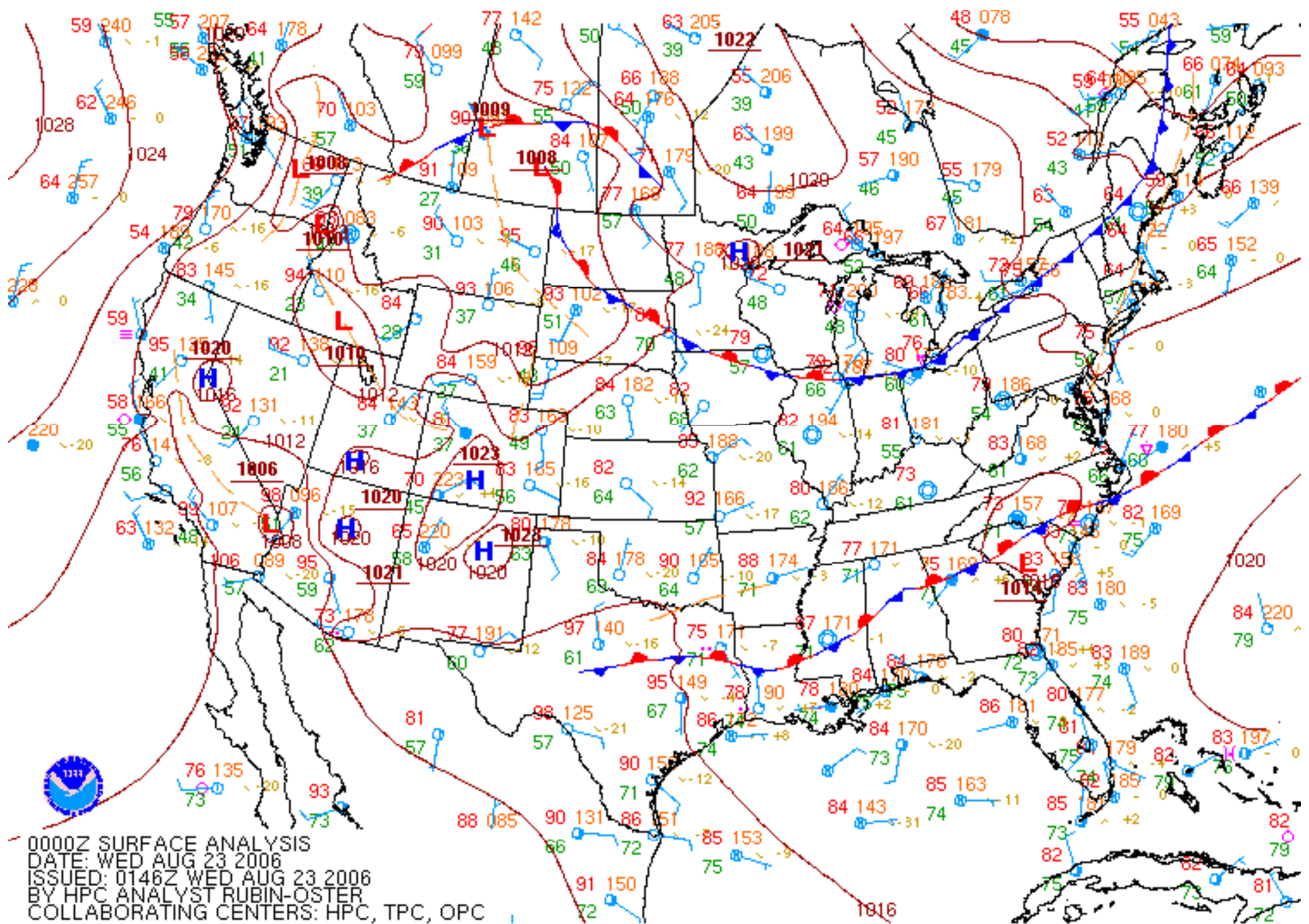


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 BY HPC ANALYST OTTO
 COLLABORATING CENTERS: HPC, TPC, OPC

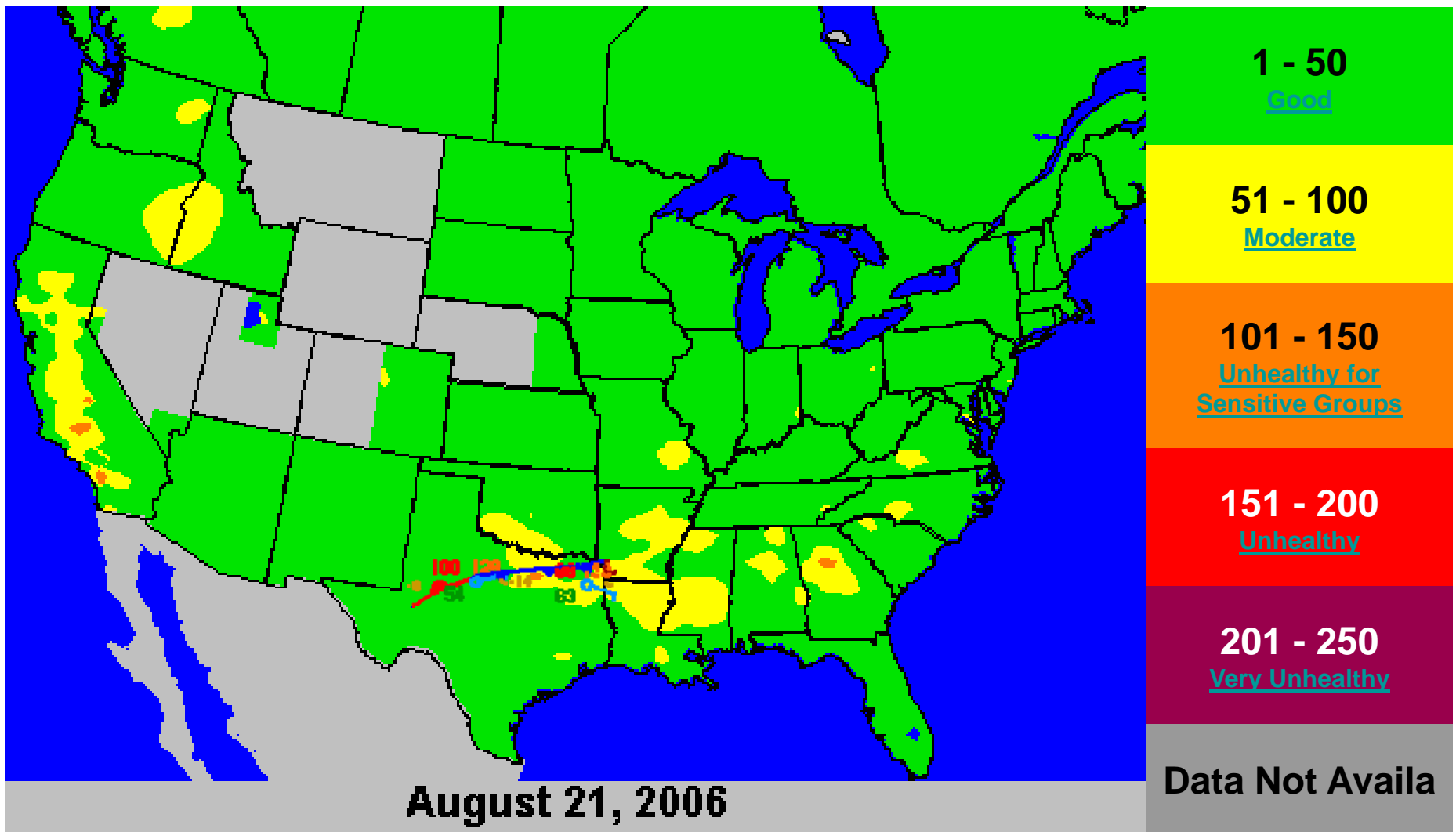


1800Z SURFACE ANALYSIS
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 COLLABORATING CENTERS: HPC, TPC, OPC

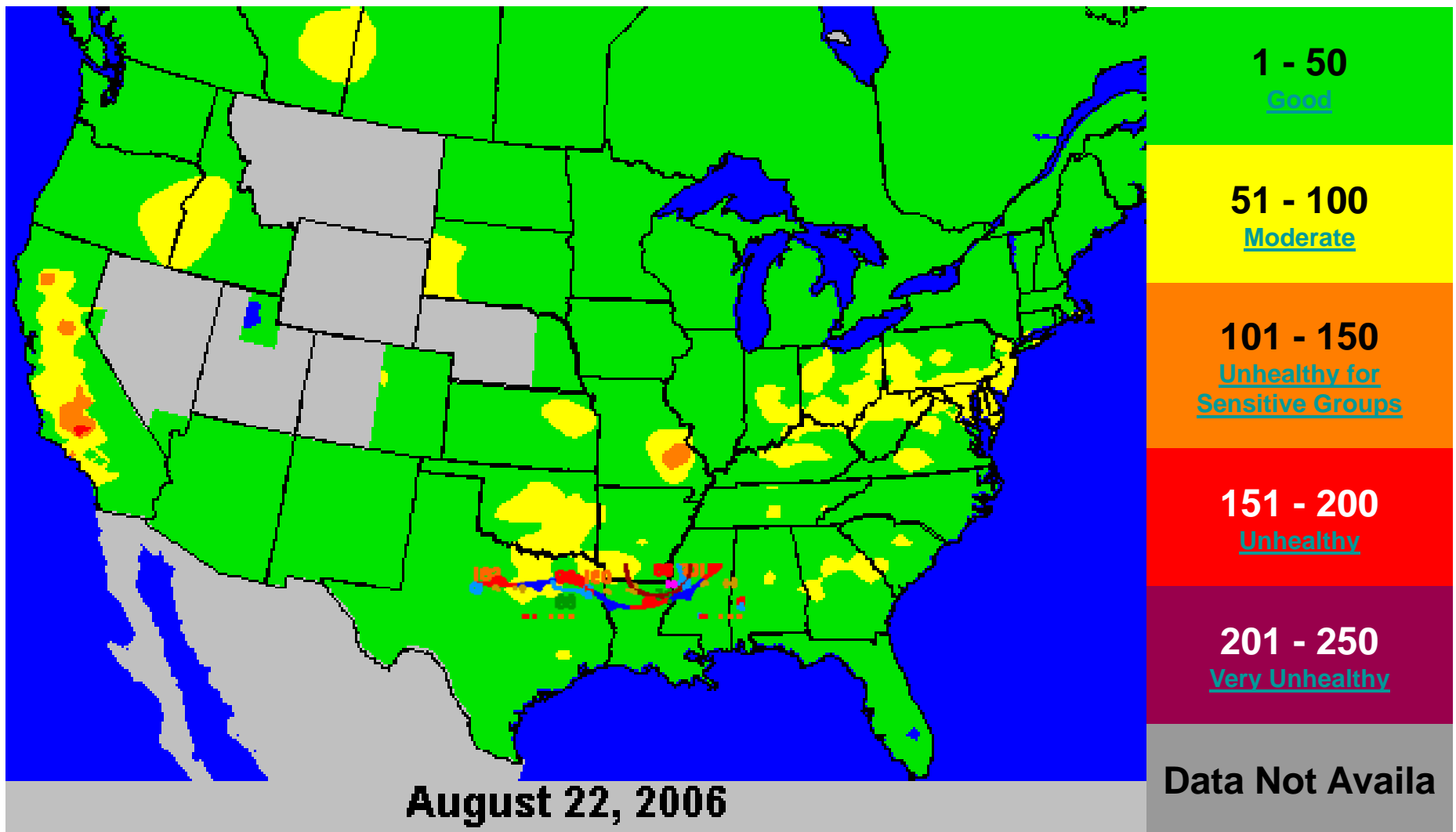




0000Z SURFACE ANALYSIS
 DATE: WED AUG 23 2006
 ISSUED: 0146Z WED AUG 23 2006
 BY HPC ANALYST RUBIN-OSTER
 COLLABORATING CENTERS: HPC, TPC, OPC



8-Hour Peak AQI for ozone for August 21, 2006 (from AIRNOW)



8-Hour Peak AQI for ozone for August 22, 2006 (from AIRNOW)

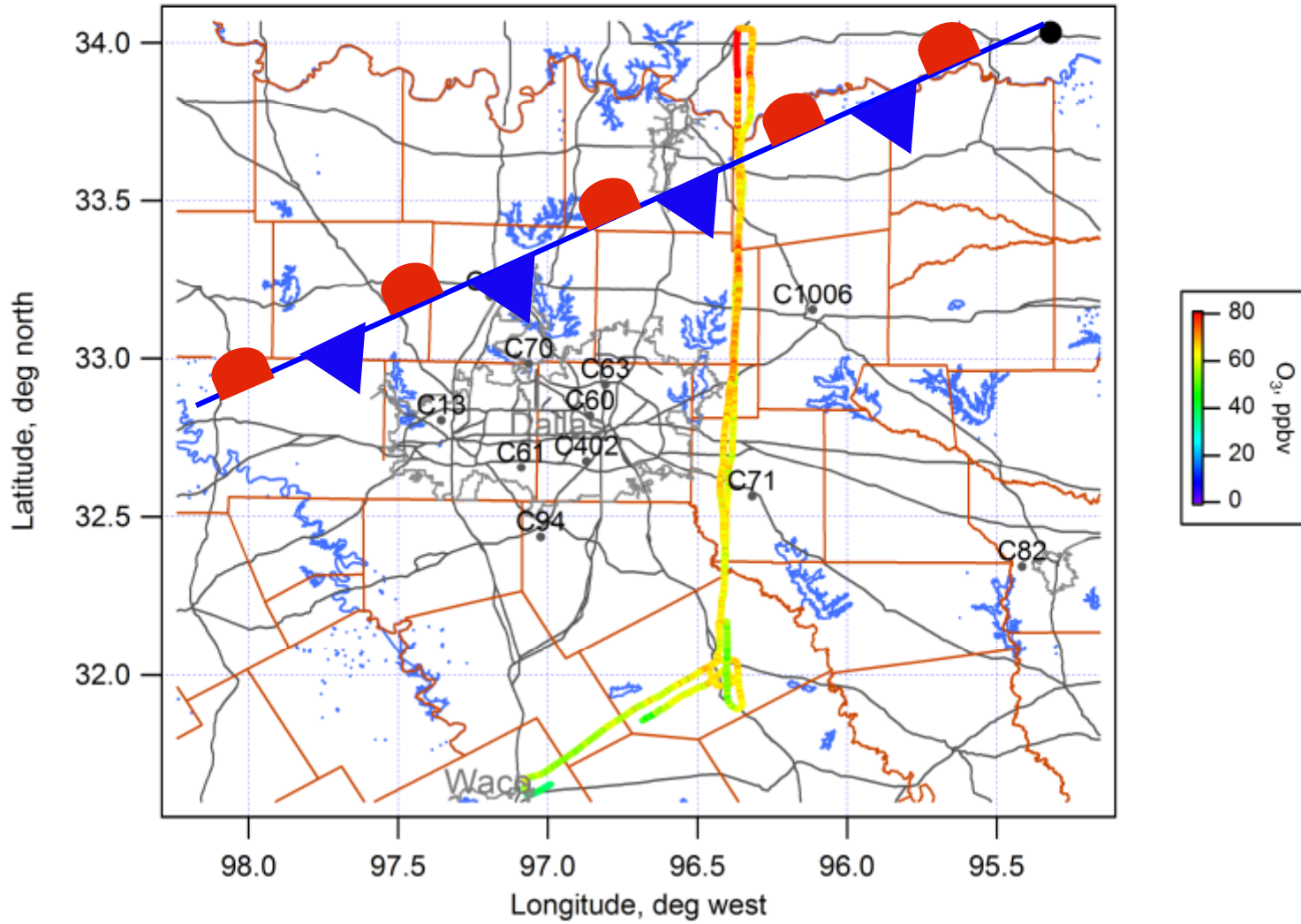
Baylor Institute for Air Science 2006 Data

Piper Aztec Flight Date: Mon, Aug 21, 2006

Flight start time = 10:33:23 AM CDT

Flight end time = 1:34:41 PM CDT

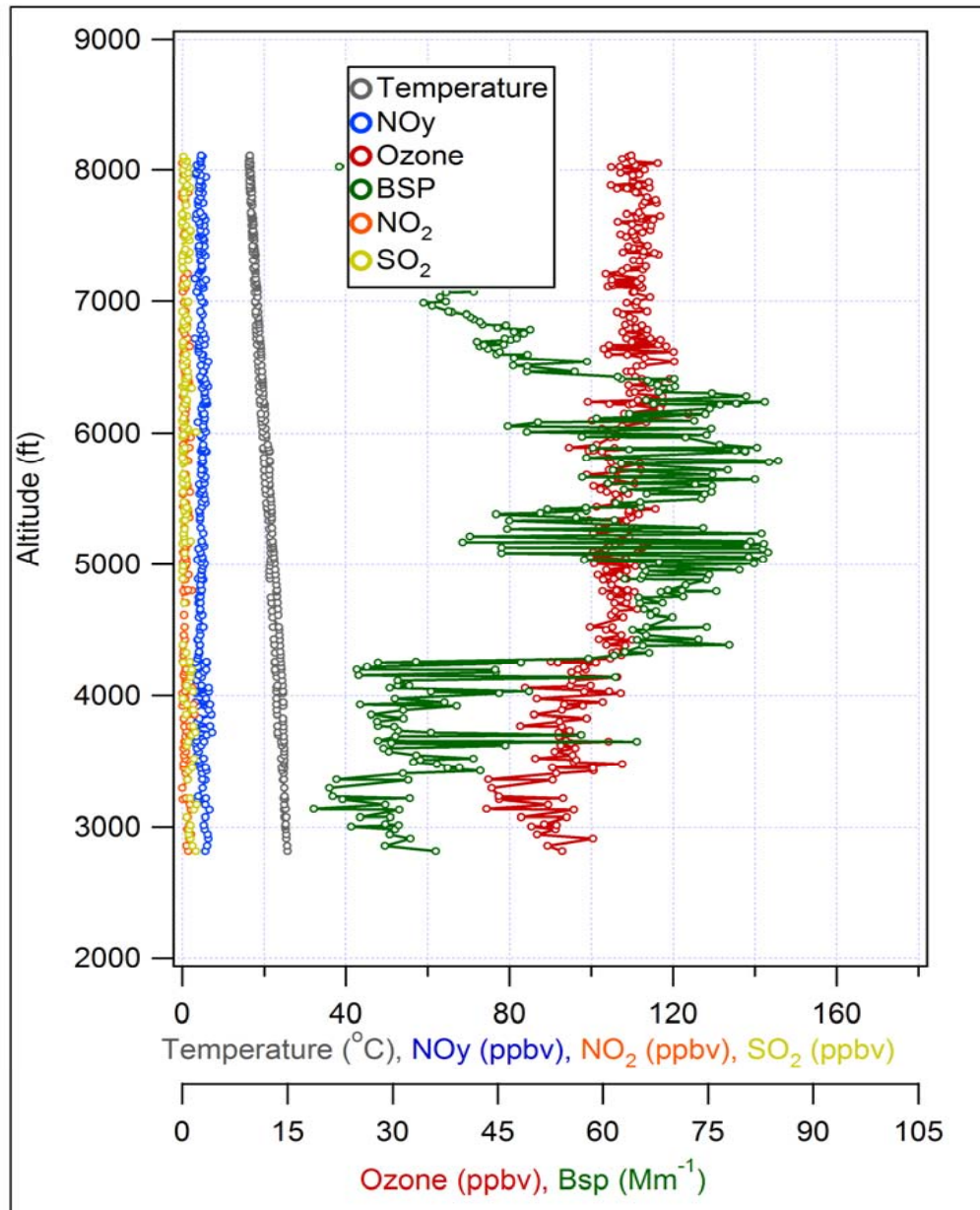
Date plotted: Mon, Aug 21, 2006



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Vertical end time = 11:13:44 AM CST

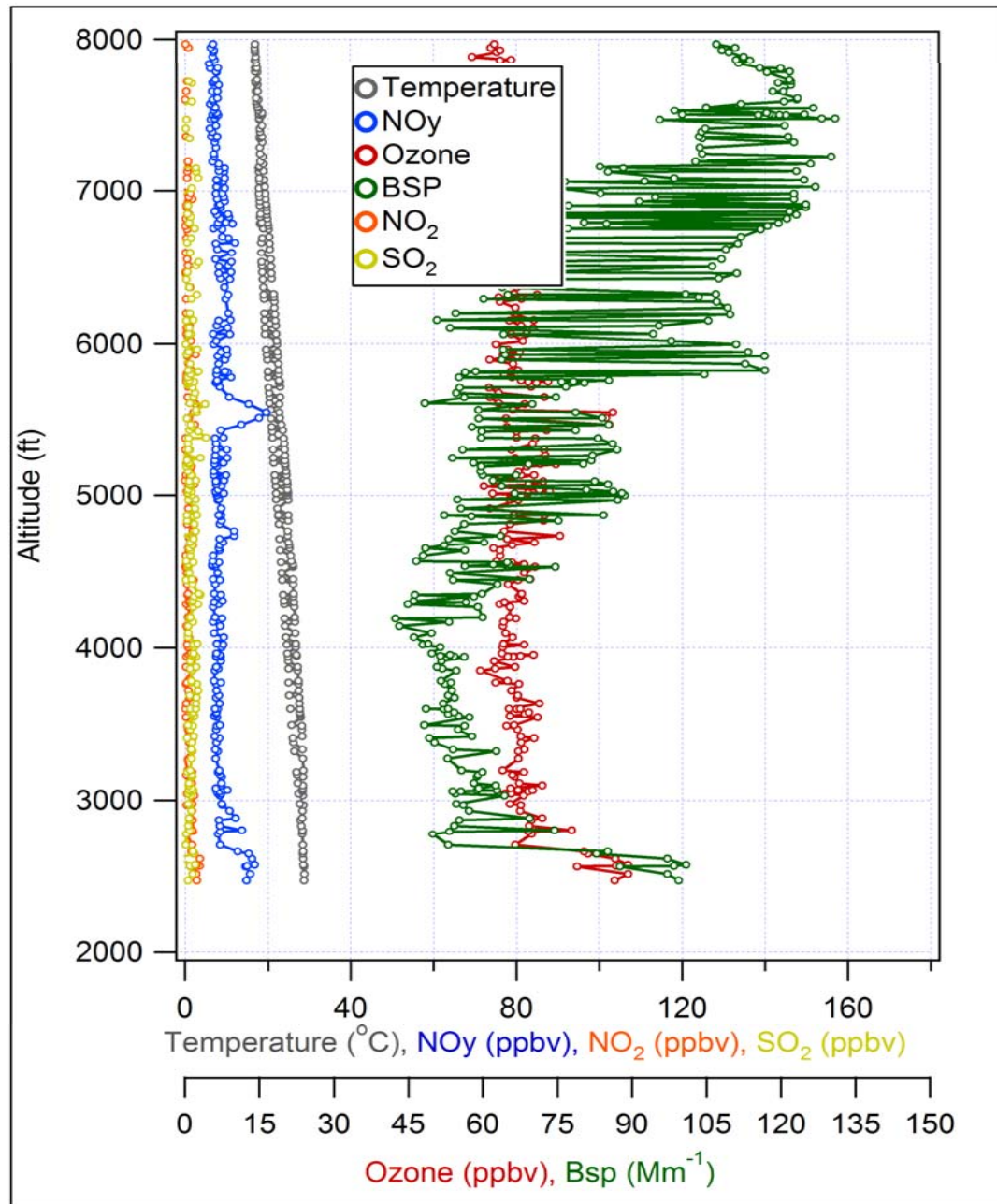
MONDAY Aug 21



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Vertical end time = 12:33:54 PM CST

MONDAY Aug 21



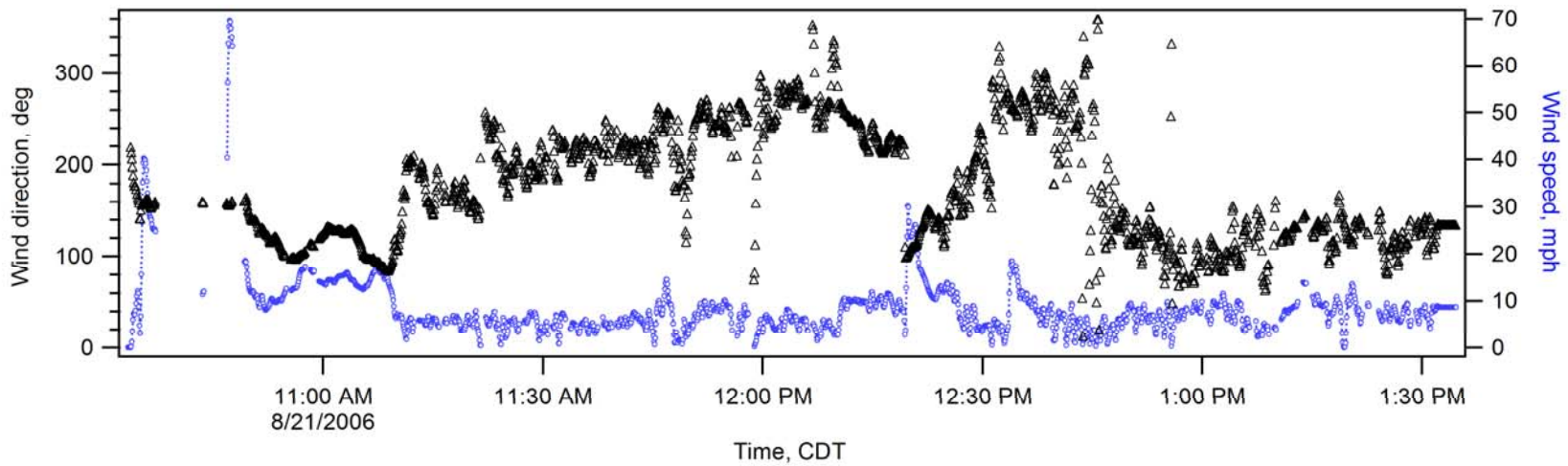
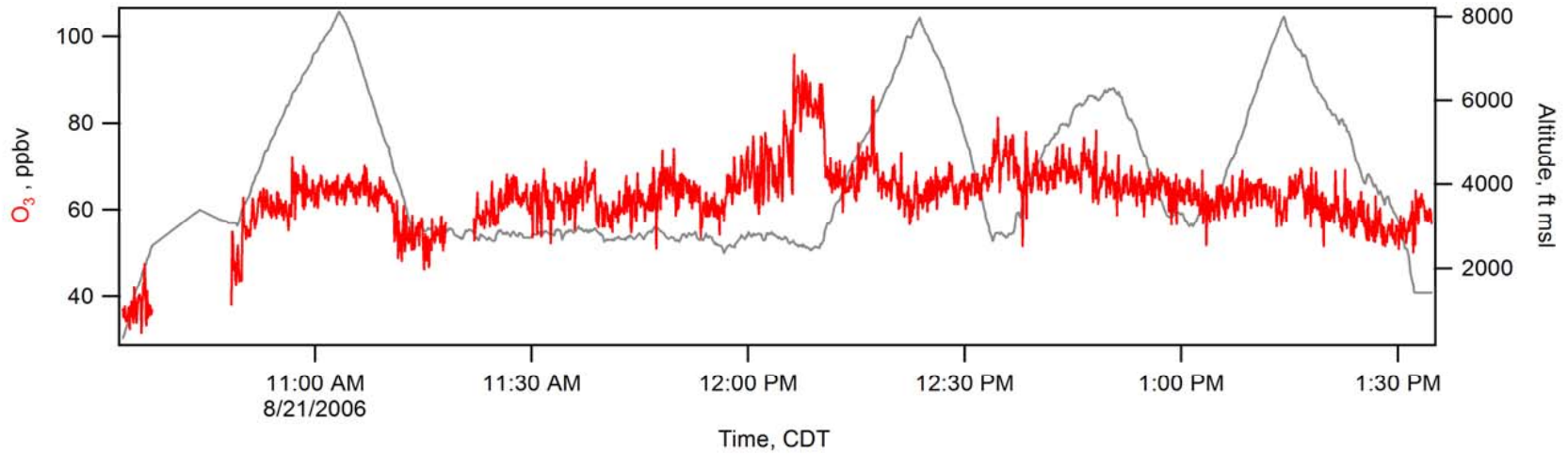
Baylor Institute for Air Science 2006 Data

Piper Aztec Flight Date: Mon, Aug 21, 2006

Date plotted: Mon, Aug 21, 2006

Flight start time = 10:33:23 AM CDT

Flight end time = 1:34:41 PM CDT



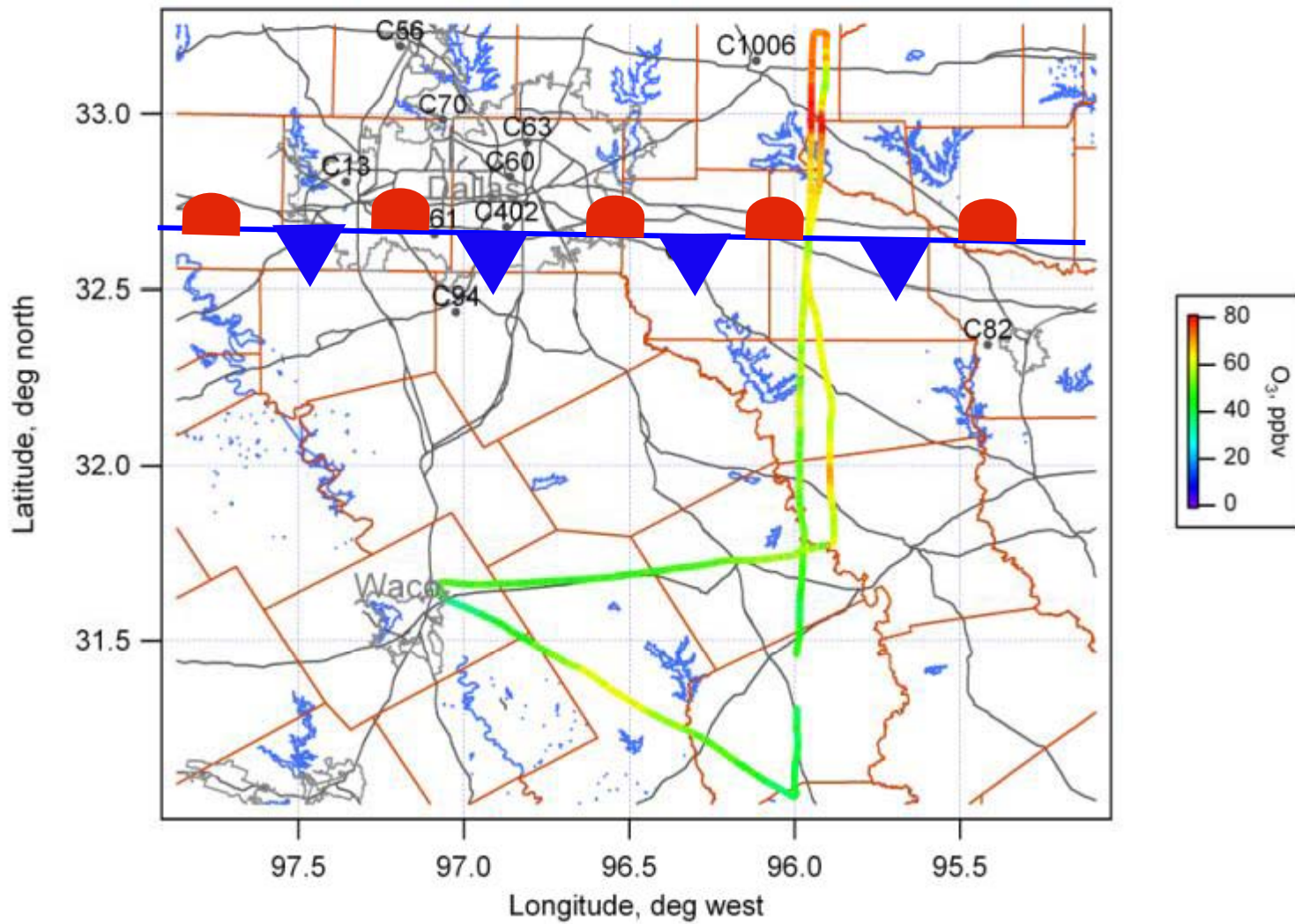
Baylor Institute for Air Science 2006 Data

Piper Aztec Flight Date: Tue, Aug 22, 2006

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Flight end time = 1:22:48 PM CDT

Date plotted: Tue, Aug 22, 2006



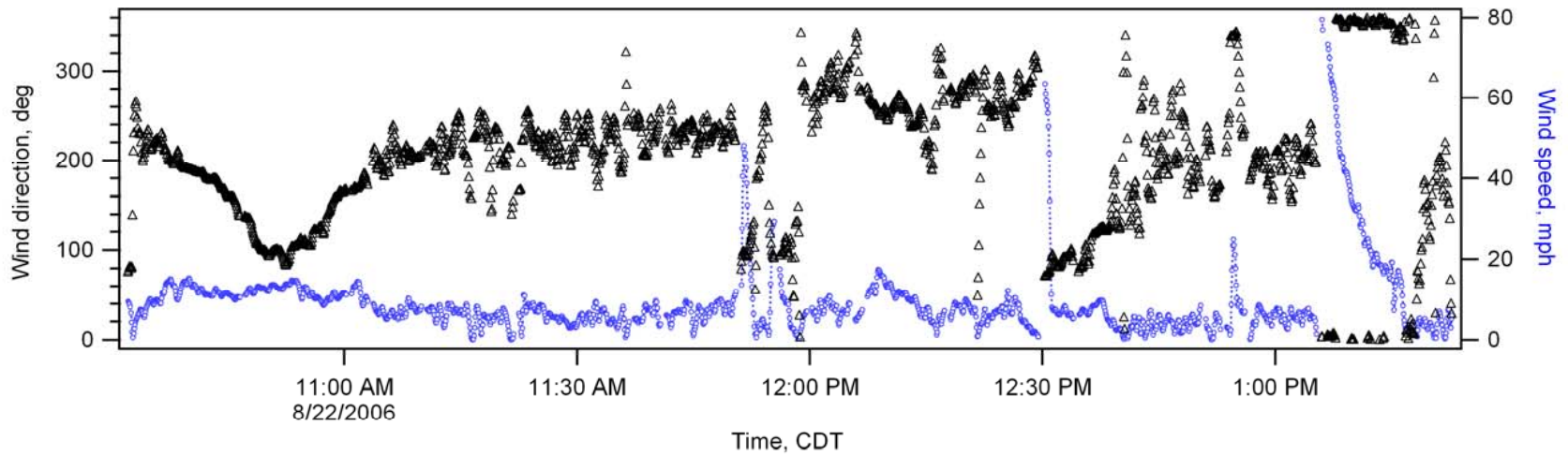
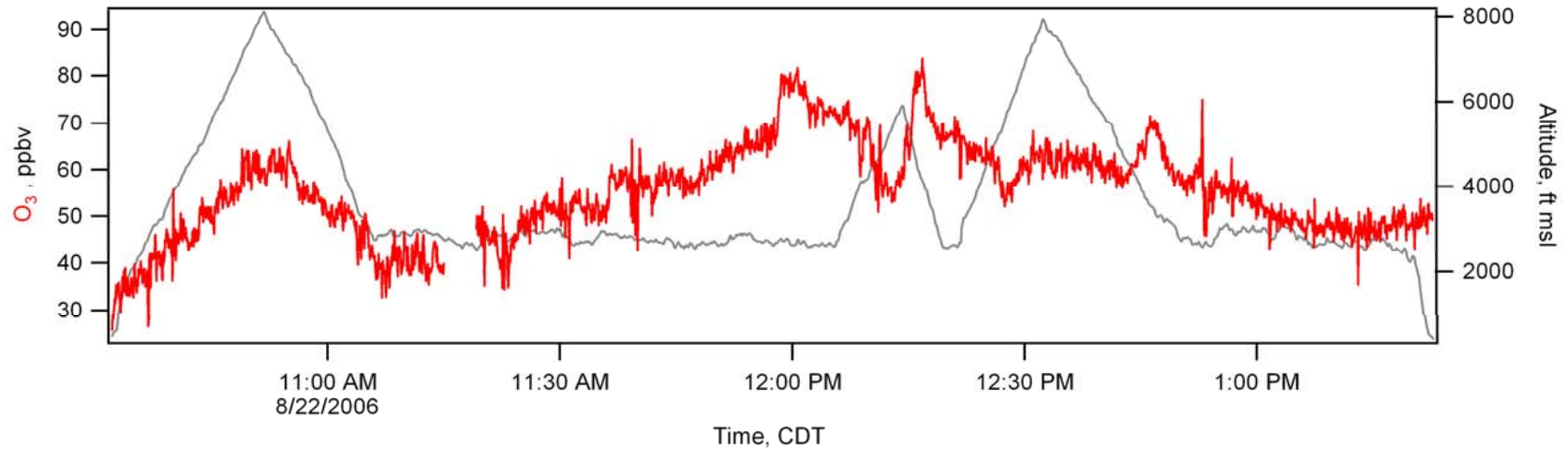
Baylor Institute for Air Science 2006 Data

Piper Aztec Flight Date: Tue, Aug 22, 2006

Date plotted: Tue, Aug 22, 2006

Flight start time = 10:32:10 AM CDT

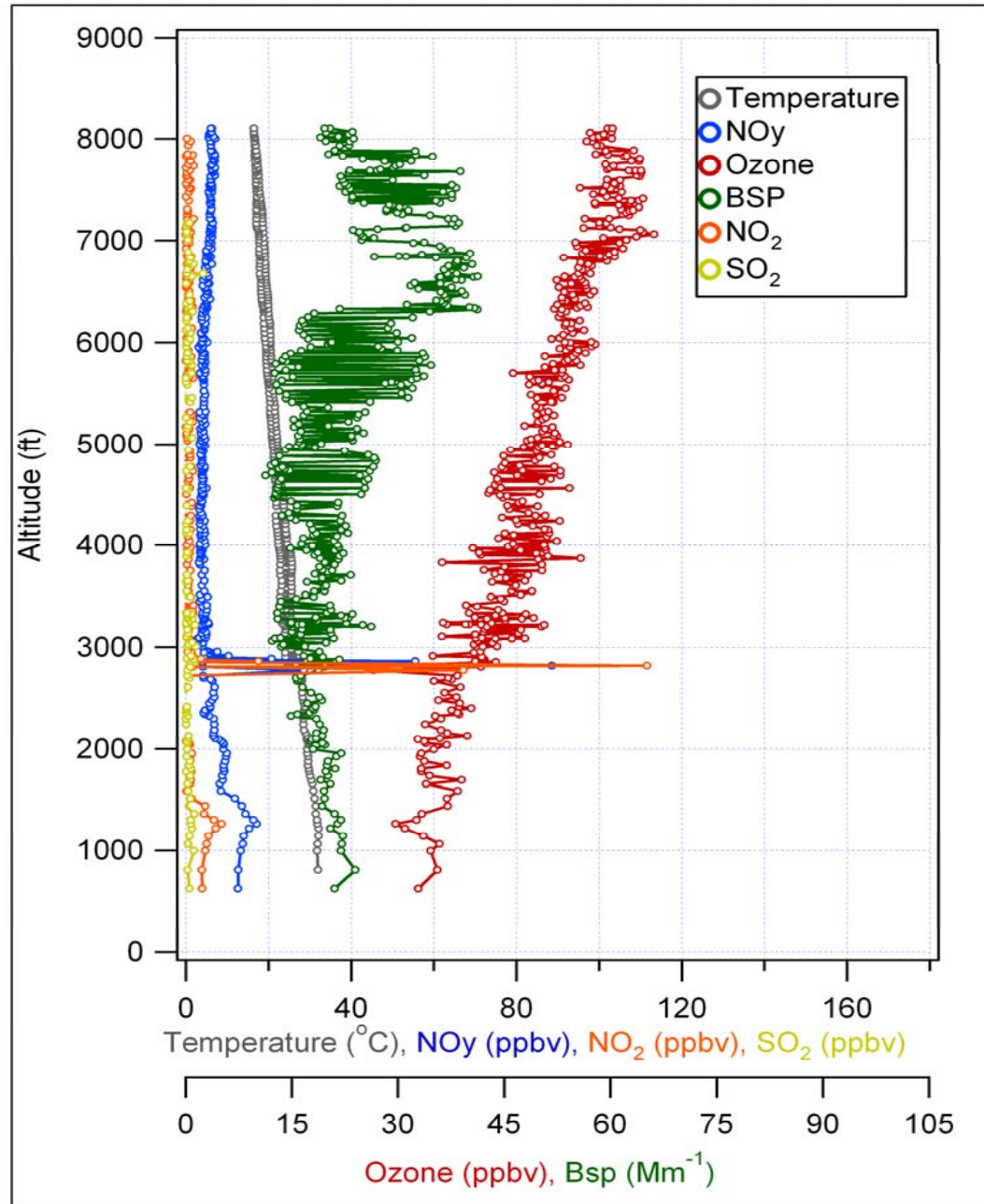
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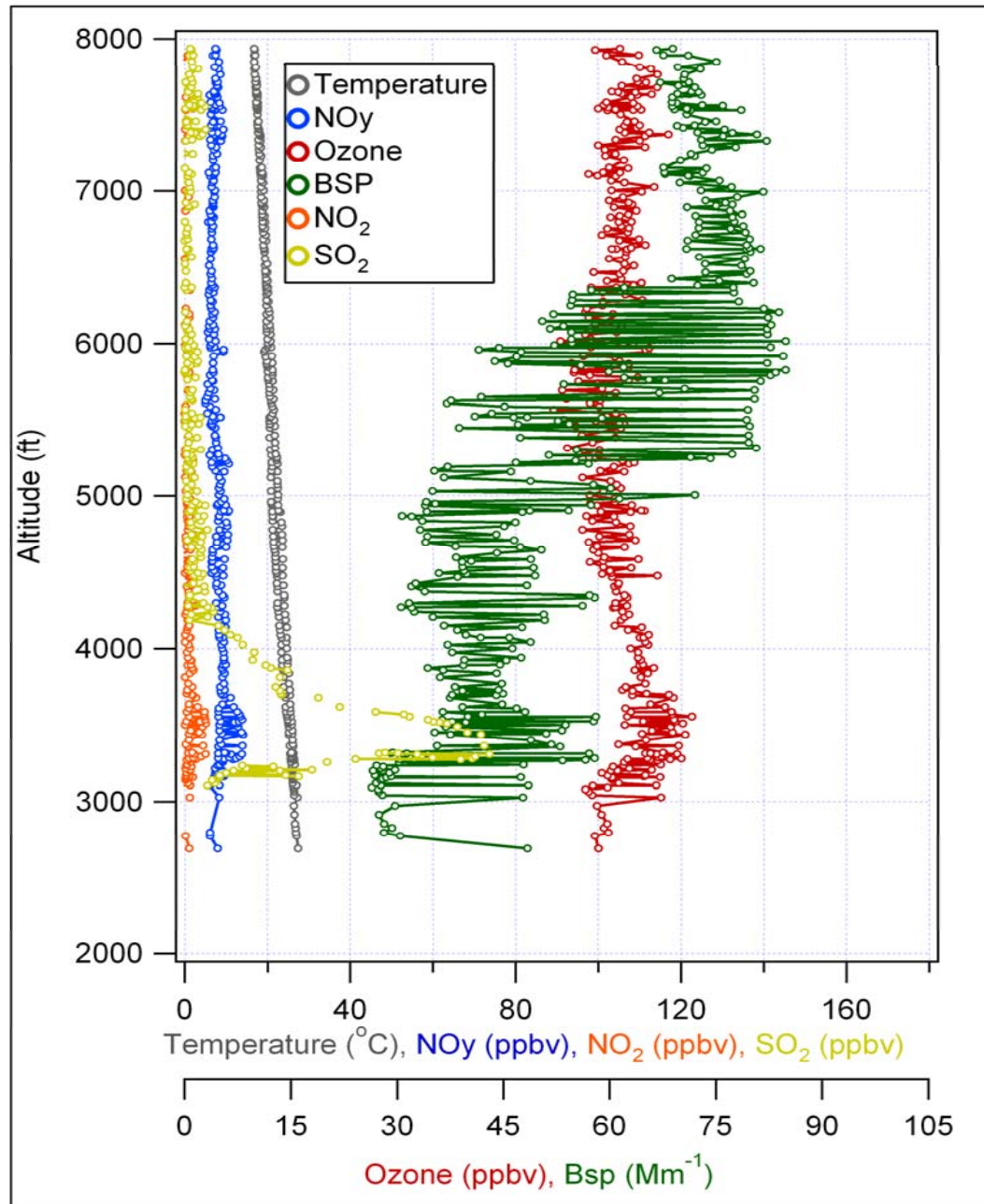
Tuesday August 22



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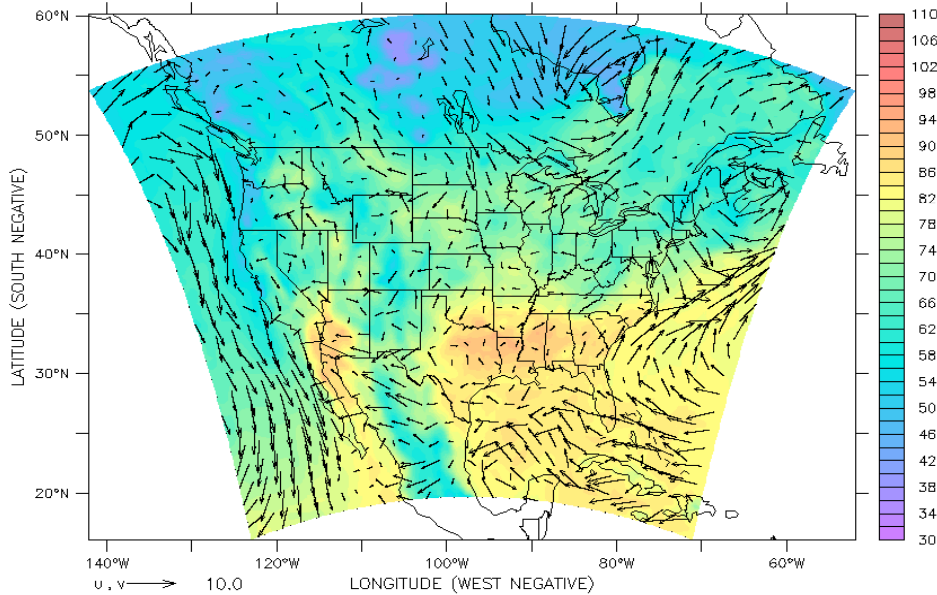
Vertical end time = 12:50:12 PM CST

Tuesday August 22



FERRET Ver. 6
NOAA/PHIL THAP
Jun 2 2007 22:43:54

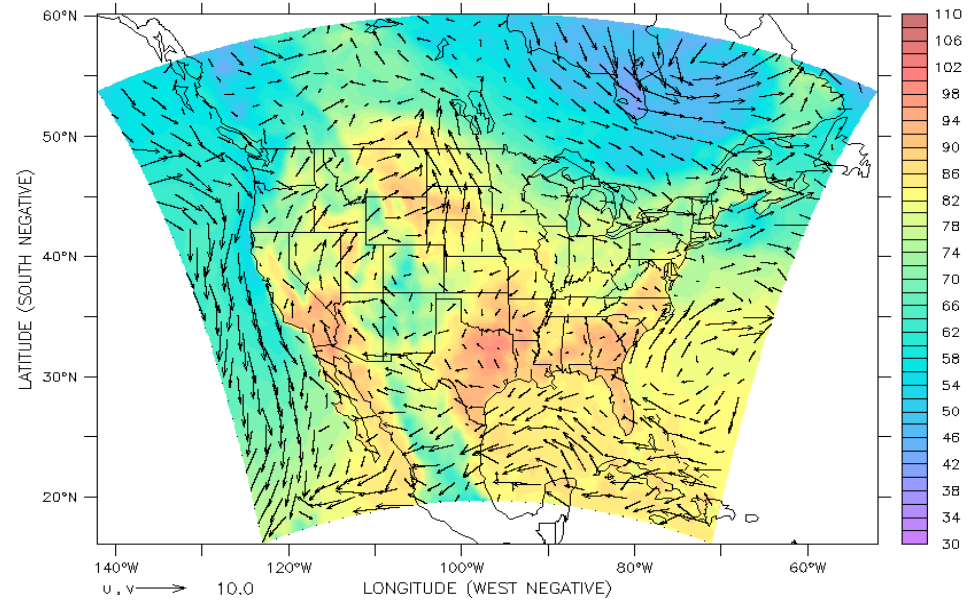
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MM5 version 3 format output on sigma levels



Temperature (F)

FERRET Ver. 6
NOAA/PHIL THAP
Jun 2 2007 22:44:51

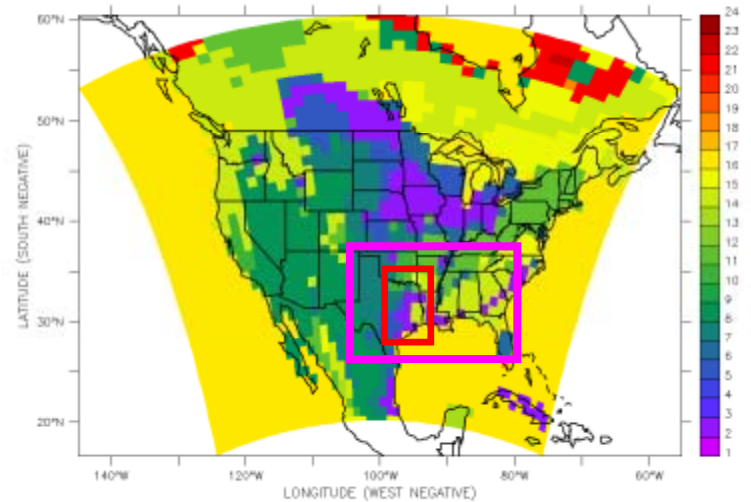
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MM5 version 3 format output on sigma levels



Temperature (F)

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MM5 version 3 format output on sigma levels



LANDUSE CATEGORY (category)

Preliminary MM5 simulations showing the stationary front over Dallas during August 21-22 episode.

Additional modeling will nest down to 12 and 4-km grid spacing.

Recommendations for future work:

Perform a detailed modeling/data analysis study for August 21-22, 2006 stationary front experiment.

1. Use data assimilation to produce the best representation of physical atmosphere for this period.
2. Perform photochemical modeling with special attention to the processes that are impacted by stationary front and lack of dilution (e.g., the impact of temperature increase on emissions and photochemistry, the impact on surface removal, ...)
3. Examining the redistribution and accumulation of passive tracers from a uniformly distributed field under meteorological conditions of August 21-22.