

4 W/D SIX FLAGS

January 11-13, 2019 Historic Snow

Jayson Gosselin

LSX Spring Media Seminar

April 6, 2019



Introduction

❖ Historic/noteworthy storm on many levels:

1. Very high snowfall rates (1+”/hr) *coincident* with the *onset* of the evening rush hour on the 11th.
2. Abnormally long duration of accumulating snowfall (36-48+ hours).
3. Storm Total amounts: widespread 12+”. Highest totals near 20”.

Travel Impacts

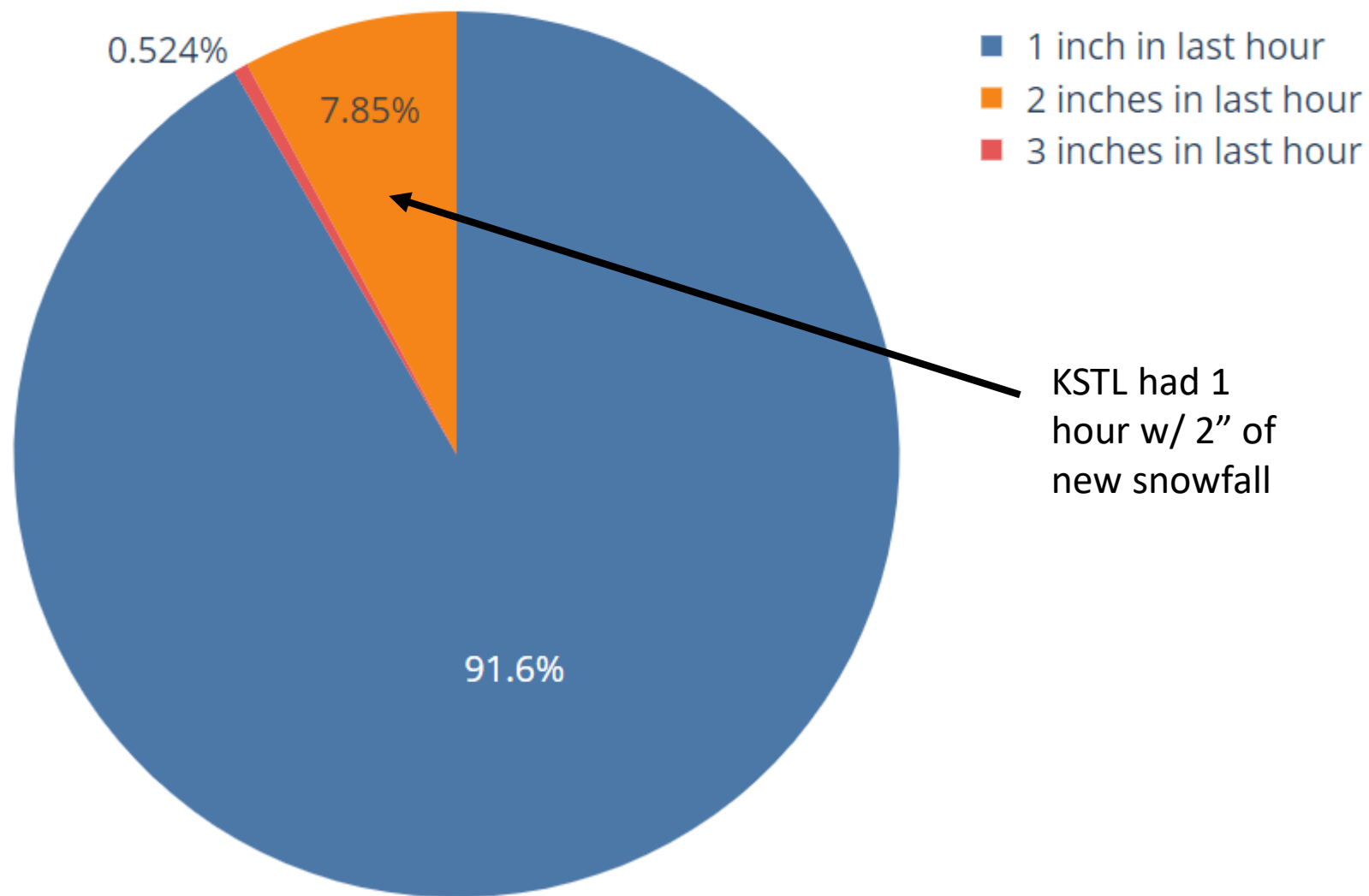
- ❖ **Nightmare scenario: Very heavy snowfall rates coincident with Friday evening's rush hour.**
 - ❖ Commutes of 6+ hours for many
 - ❖ Some drivers in vehicles over 15 hours on I-44
 - ❖ MSHP responded to ~4000 calls for help, rescued ~1800 stranded motorists, and recorded 878 crashes on interstates/highways
 - ❖ 57 injuries, 4 fatalities due to traffic accidents in Missouri.
 - ❖ Illinois state troopers responded to ~300 crashes including one of which was fatal and 800 calls for assistance.

Travel Impacts

❖ Aviation:

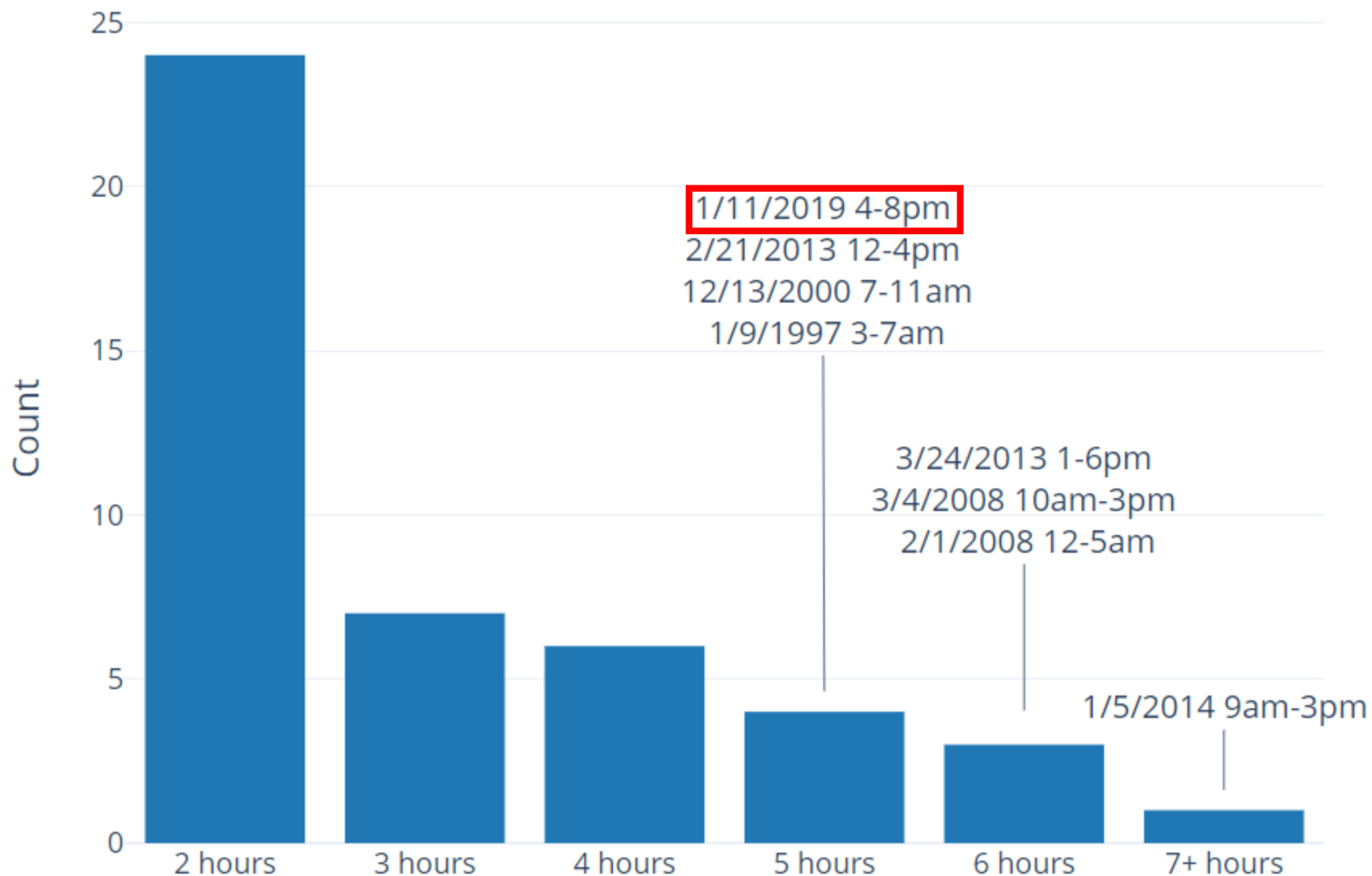
- ❖ 209 total canceled flights at KSTL.
- ❖ American Airlines aircraft slid off runway at KCOU on the afternoon of the 11th, causing both runways to close. 80 passengers were on board but thankfully no injuries/fatalities.

SNINCR values: 191 times since Dec 1996

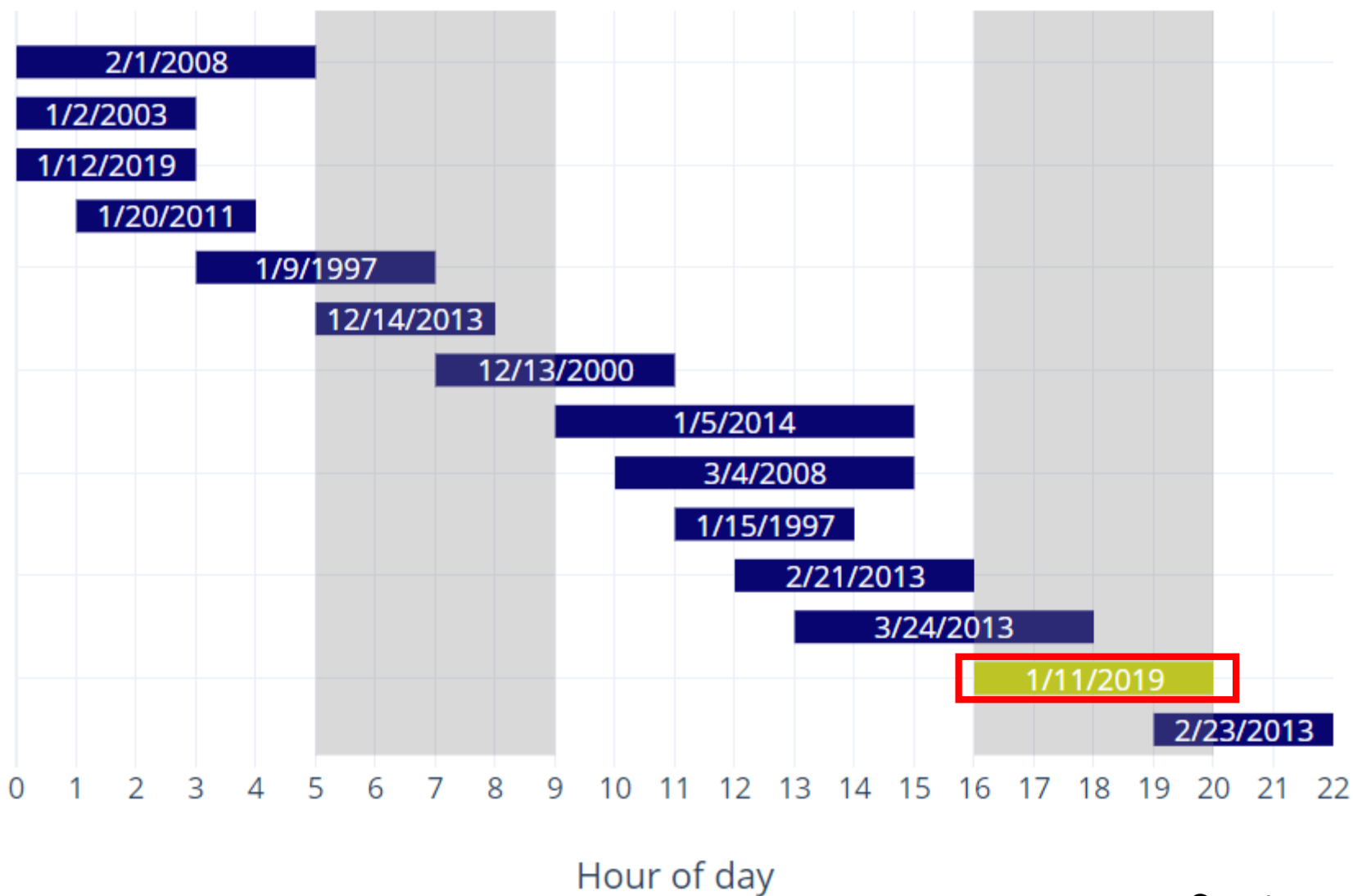


Courtesy of:
Lewis Kanofsky

Strings of consecutive hours of SNINCR at KSTL Dec 1996 - Jan 15 2019



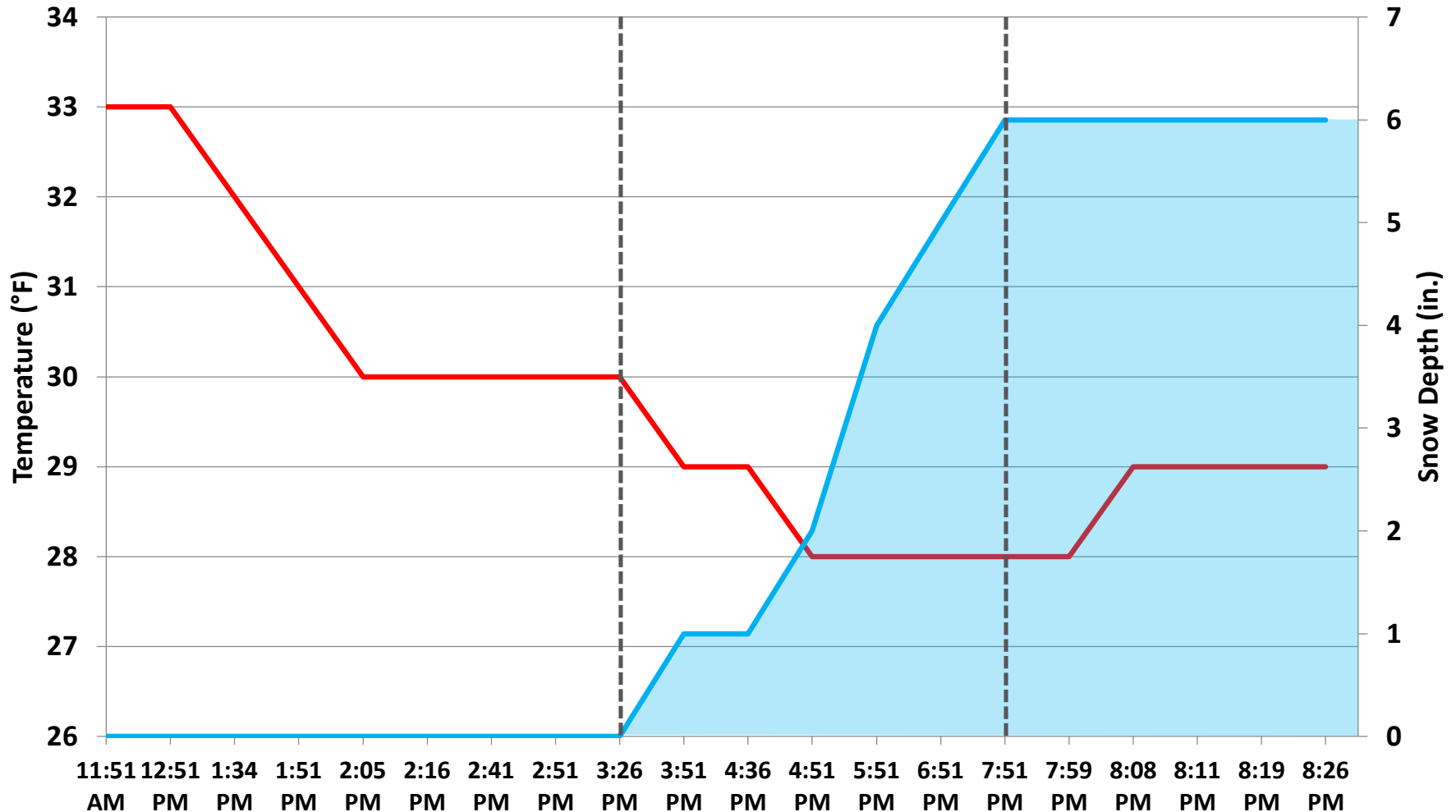
≥ 4 consecutive hours of SNINCR at KSTL
Dec 1996 - Jan 15 2019



Courtesy of:
Lewis Kanofsky

Snow Depth/Temperature Time Series

Lambert St. Louis International Airport

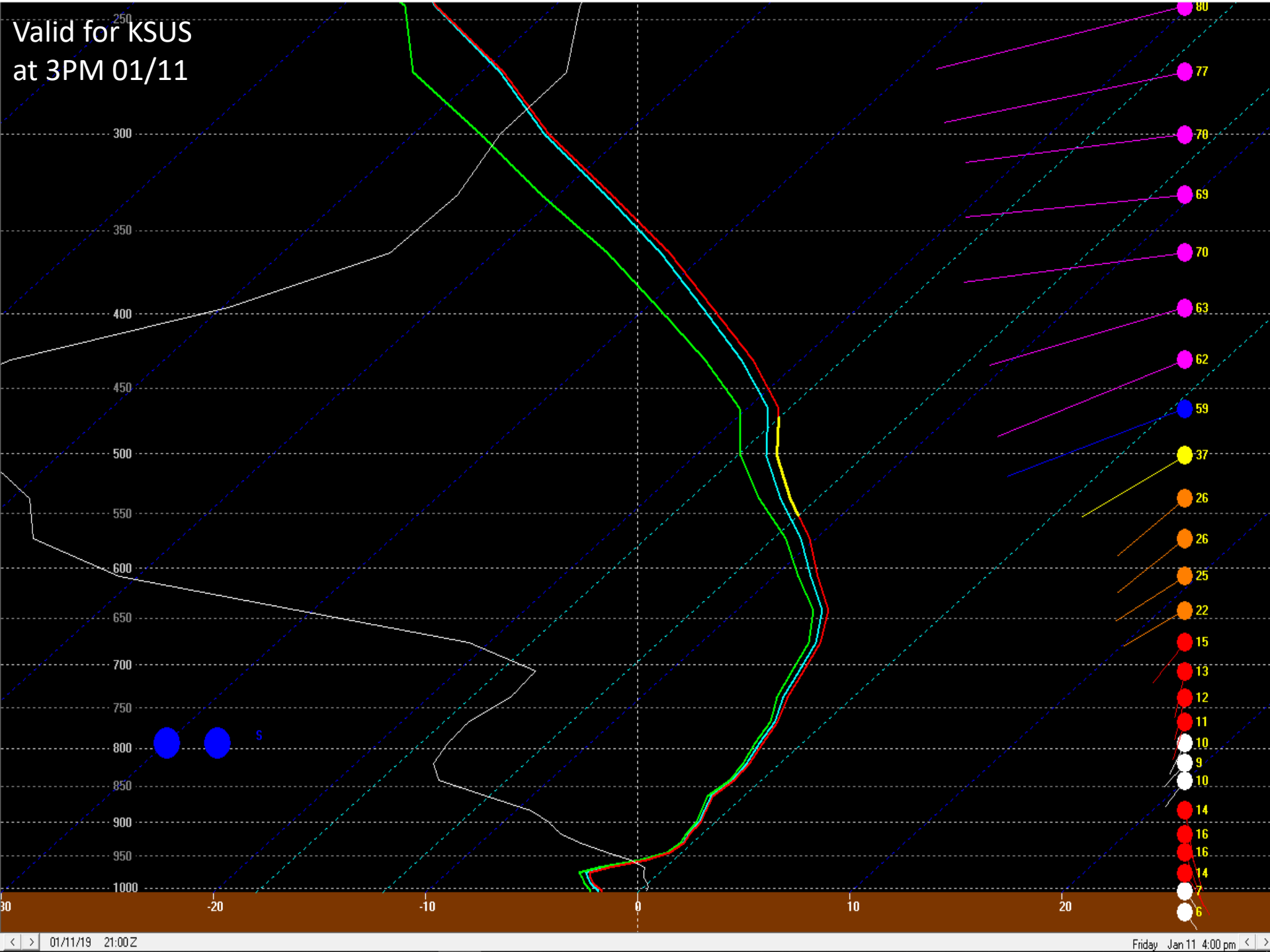


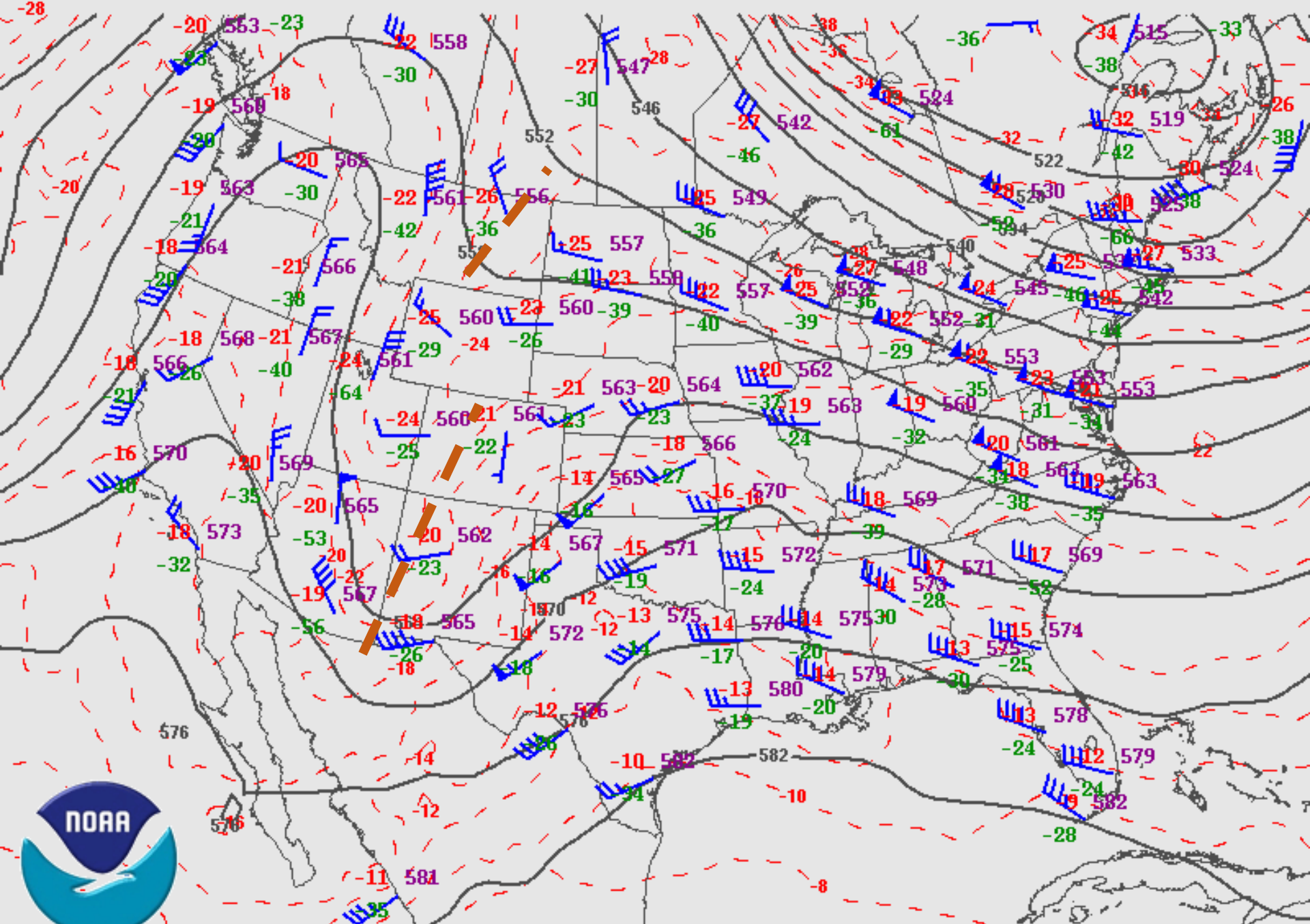
↑
Snow Began

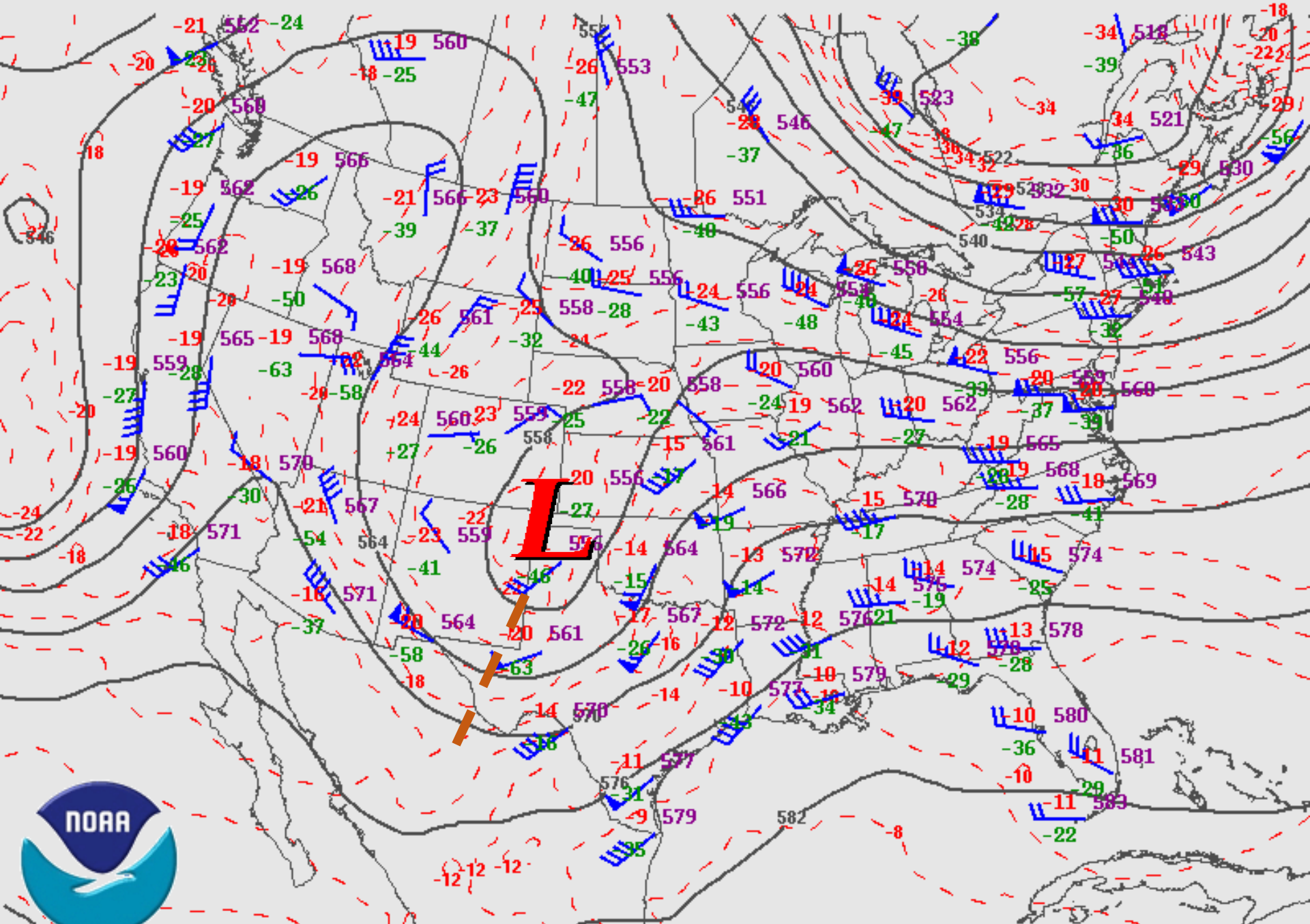
— Temperature — Snowfall

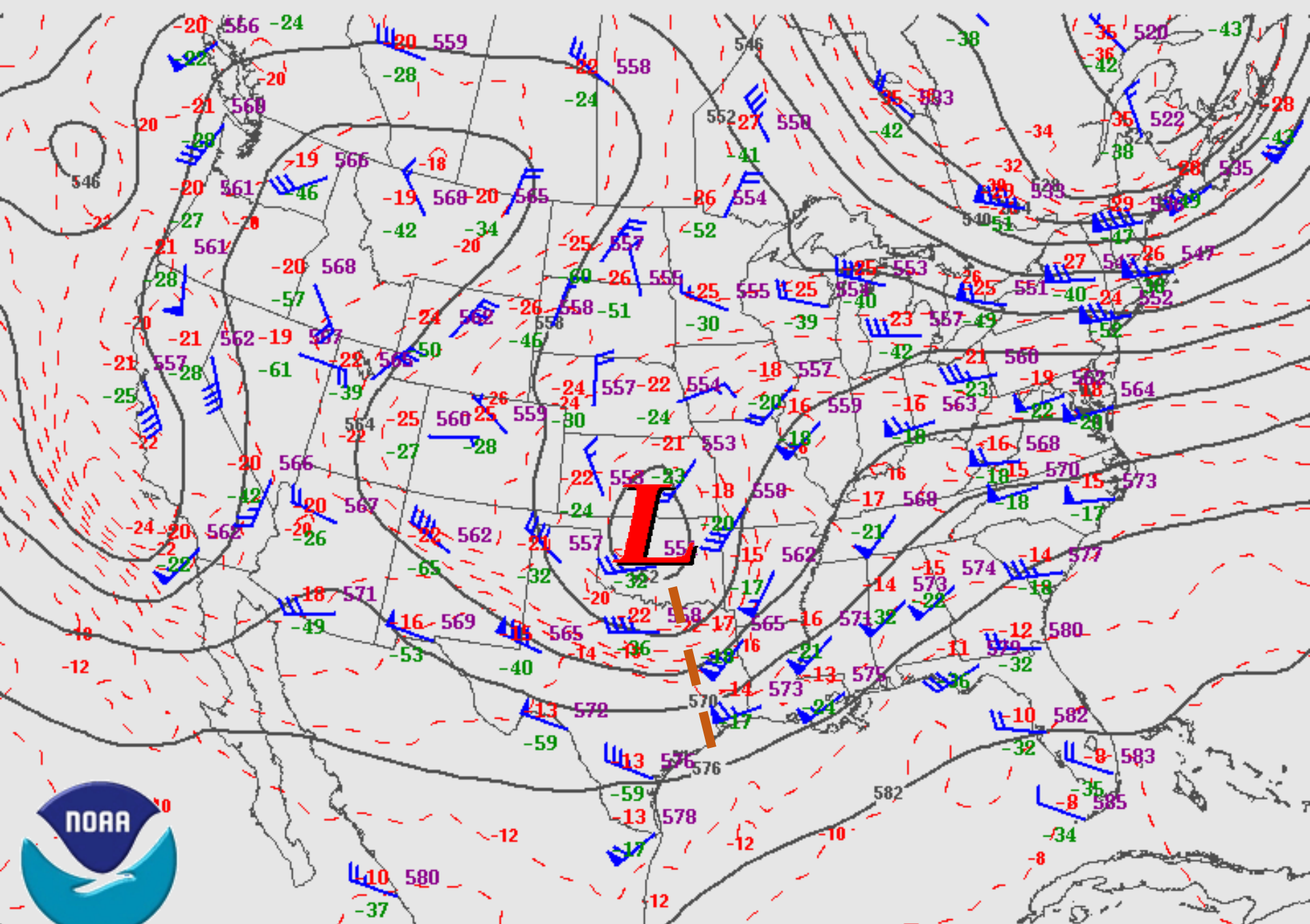
Courtesy of:
Fred Glass

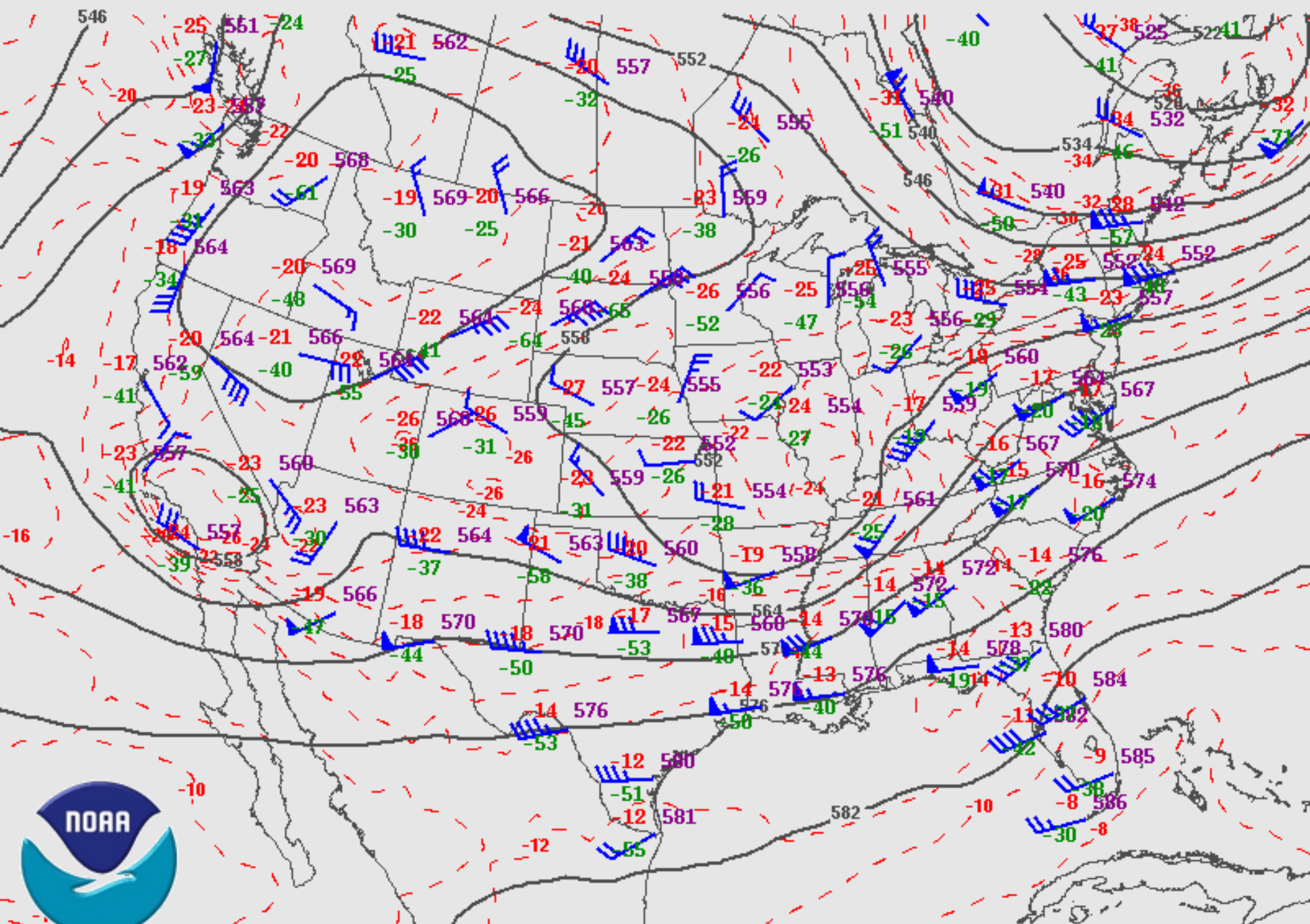
Valid for KSUS
at 3PM 01/11

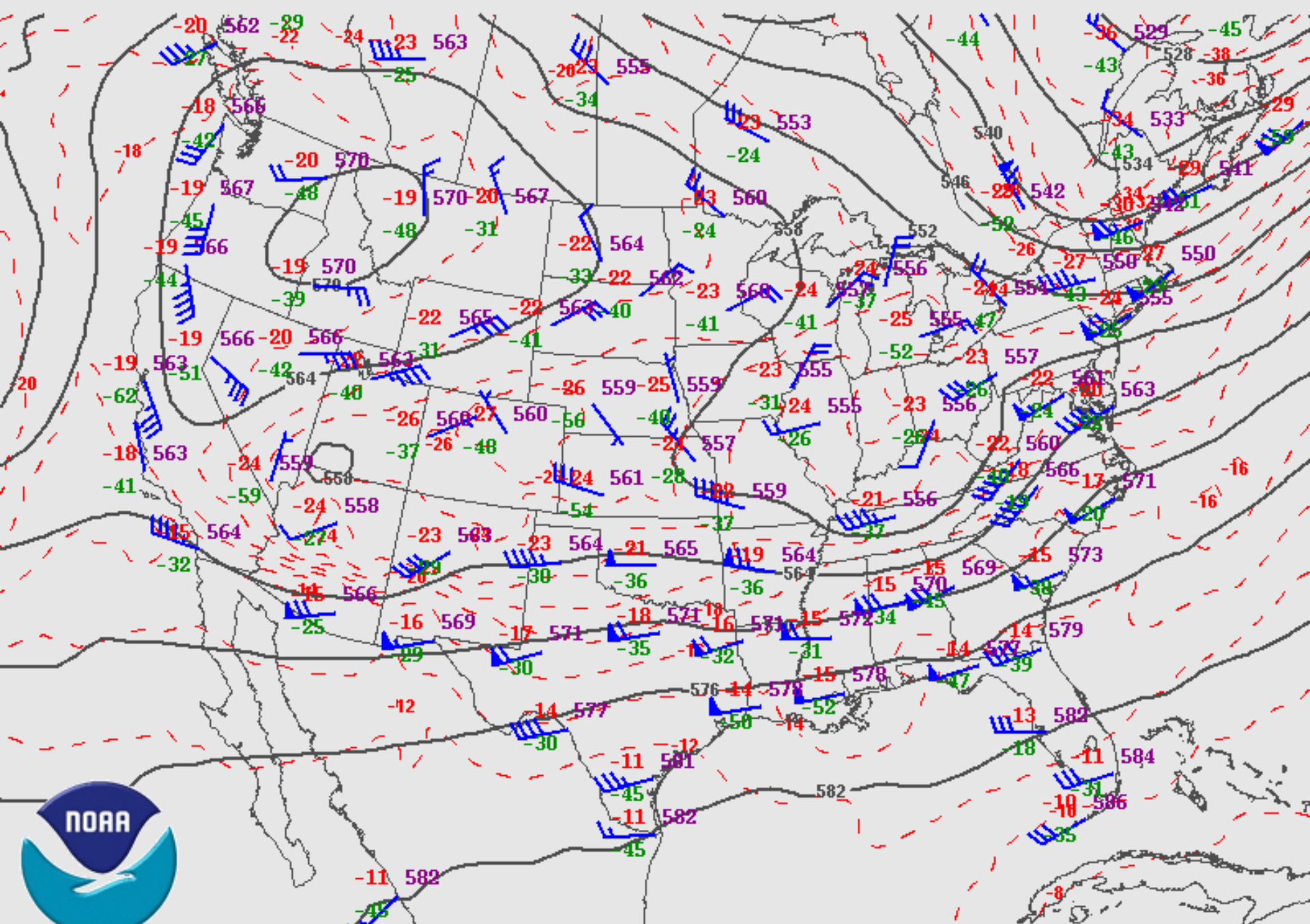






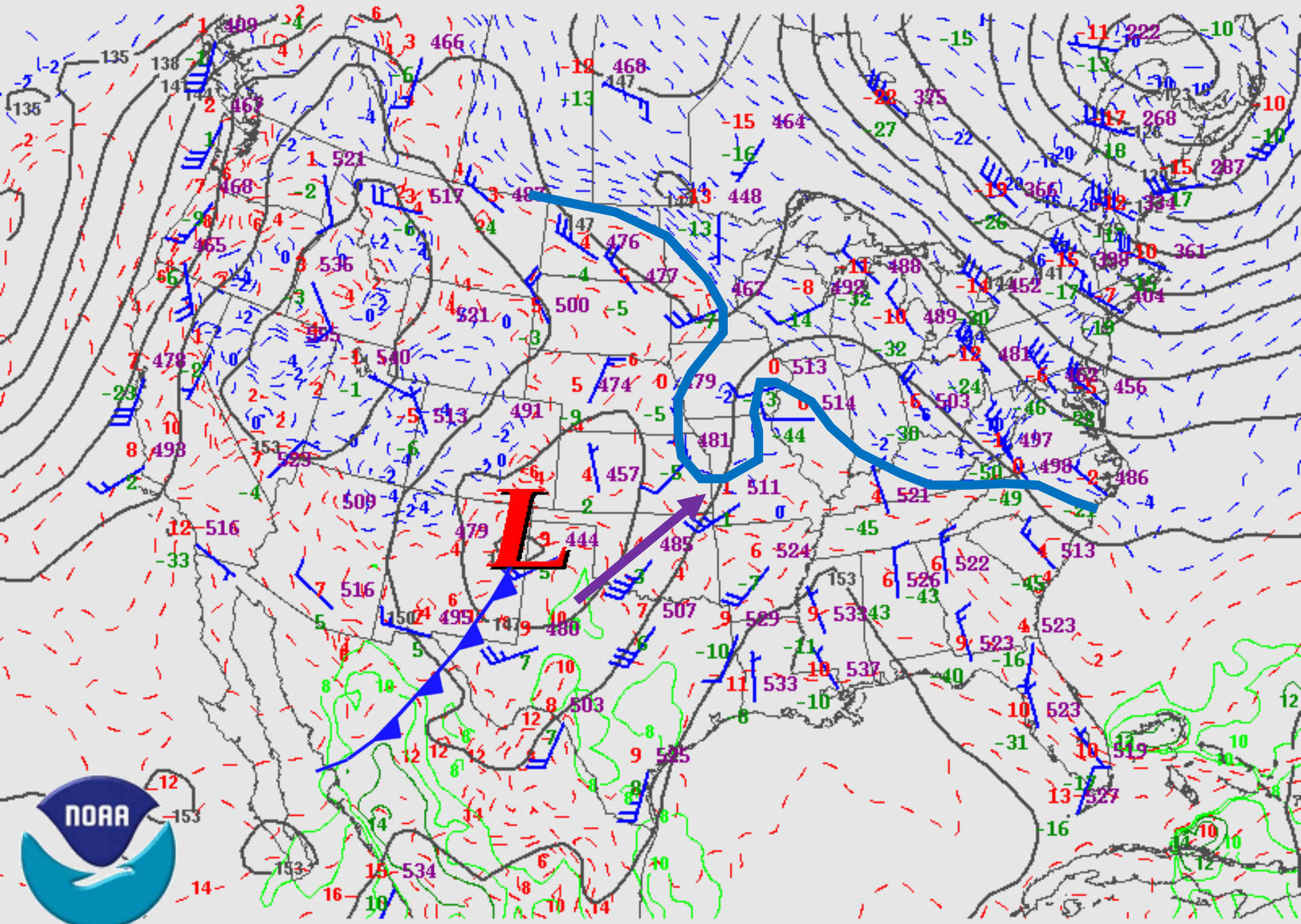


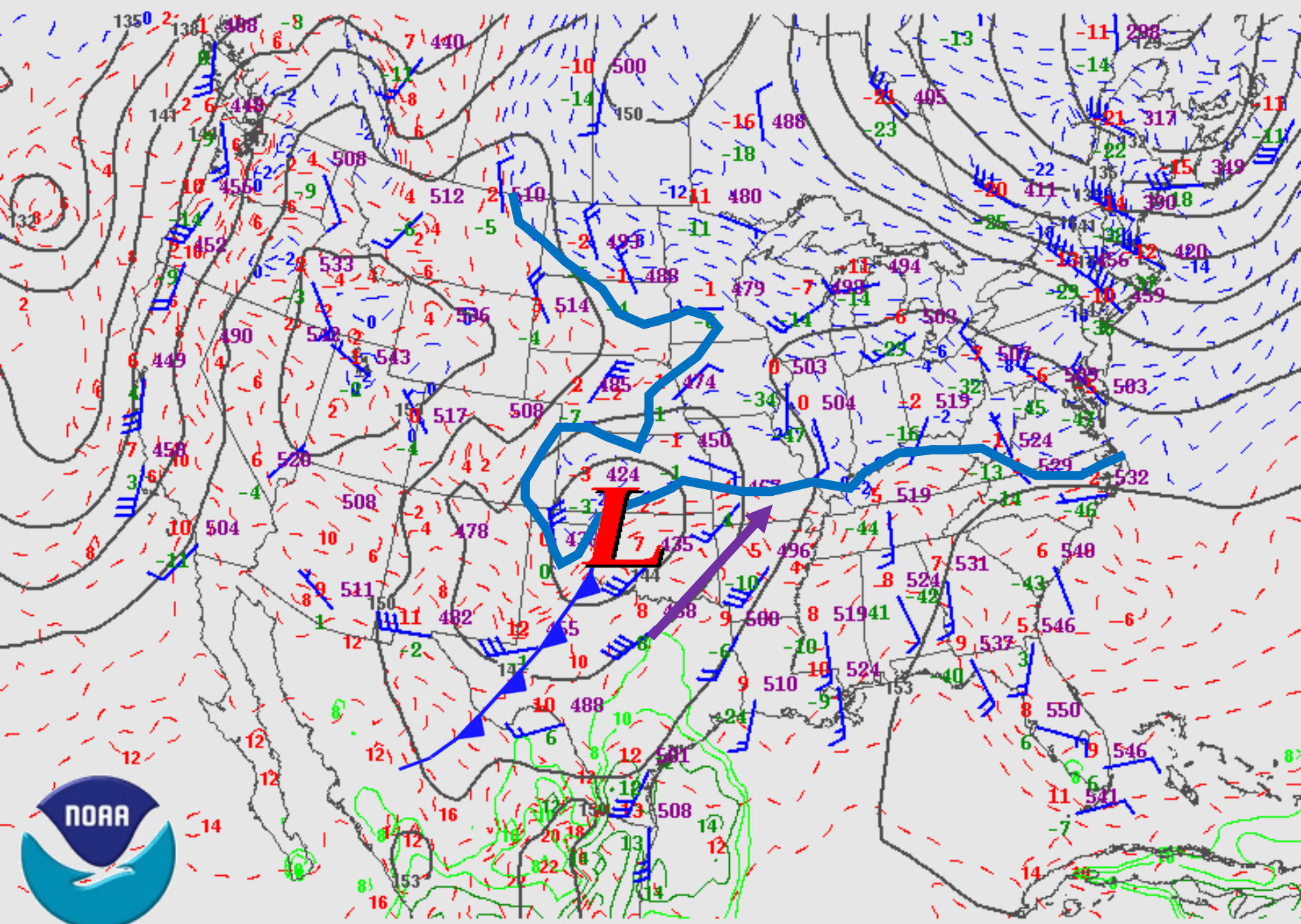


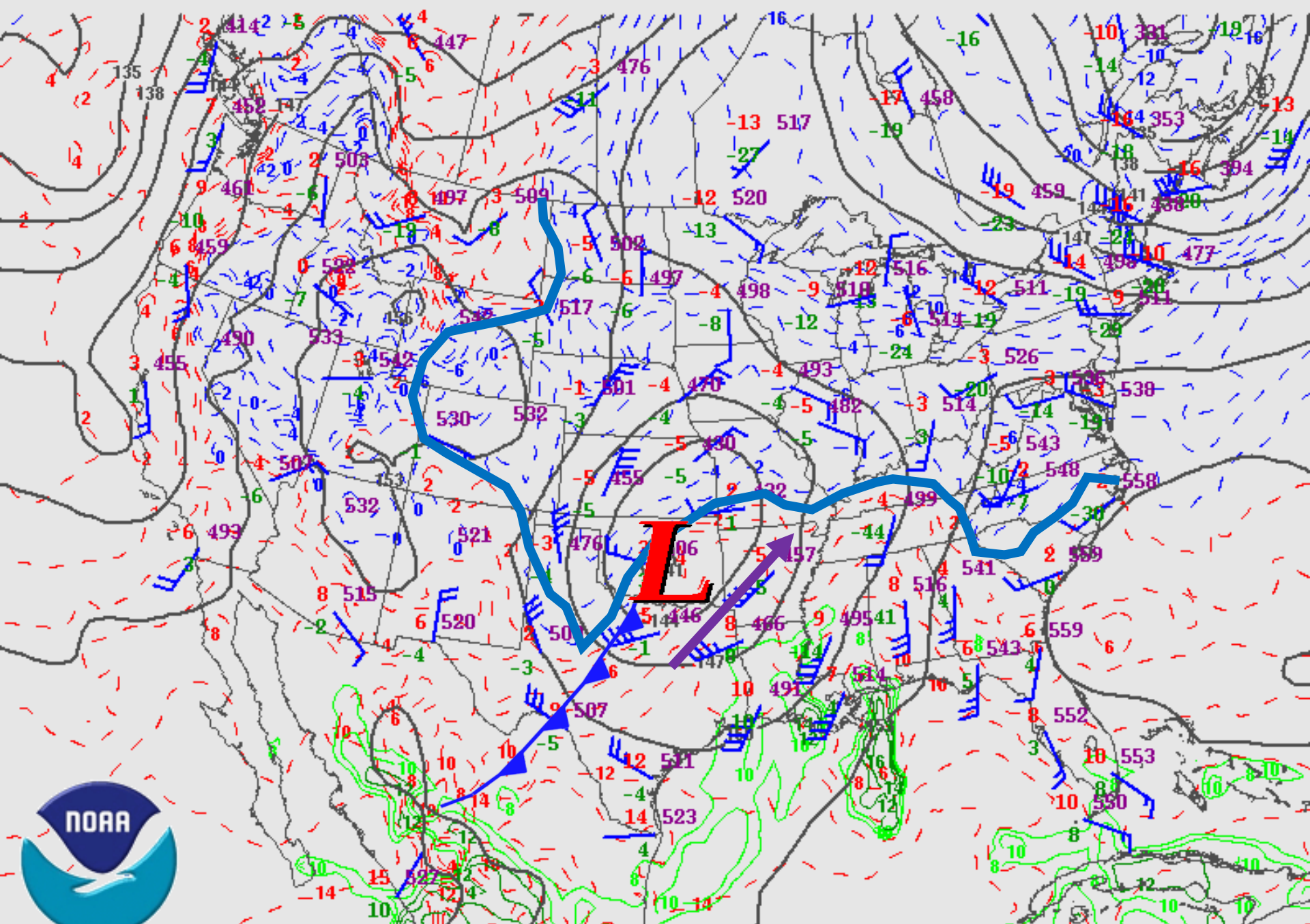


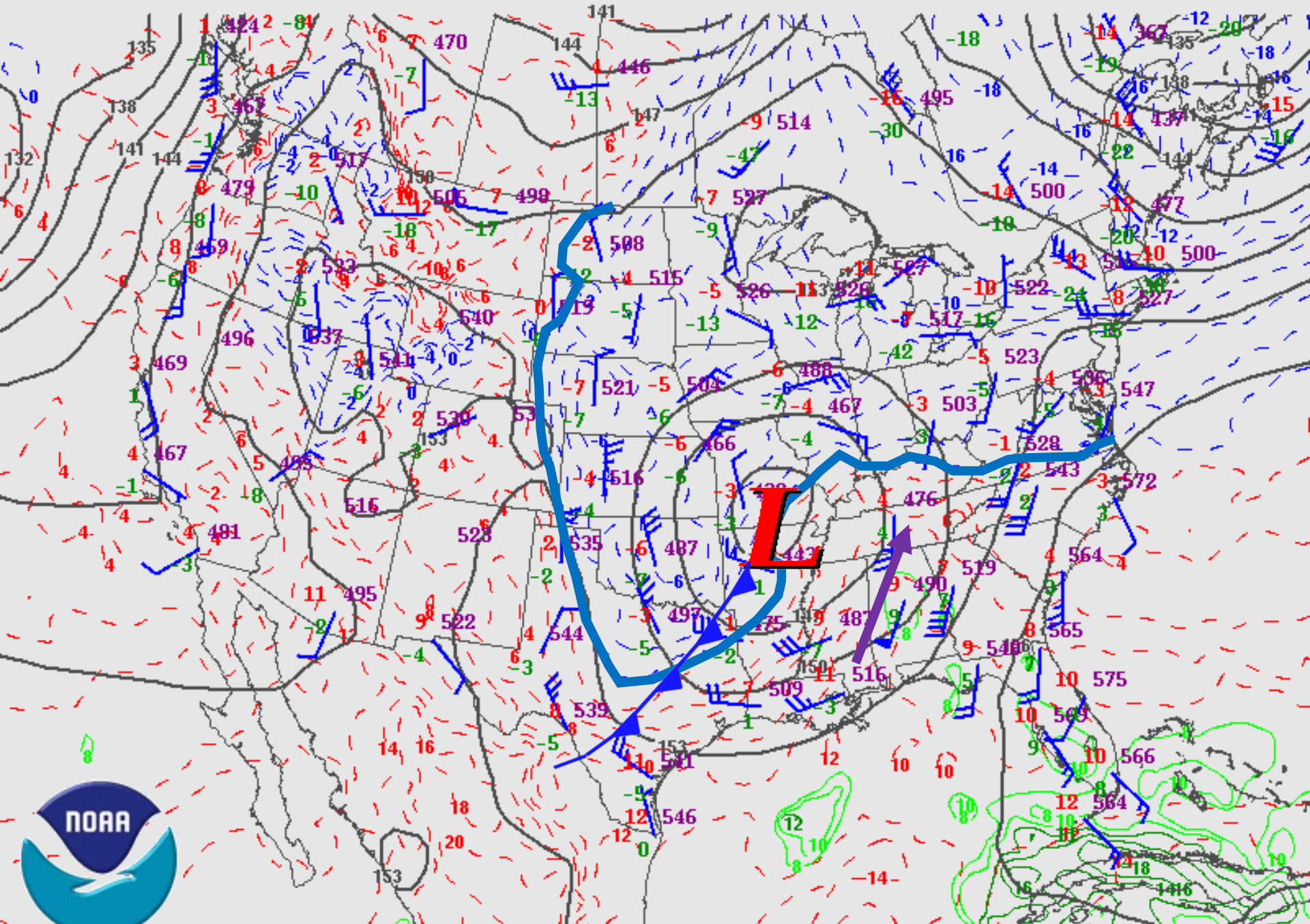
National Weather Service
Storm Prediction Center

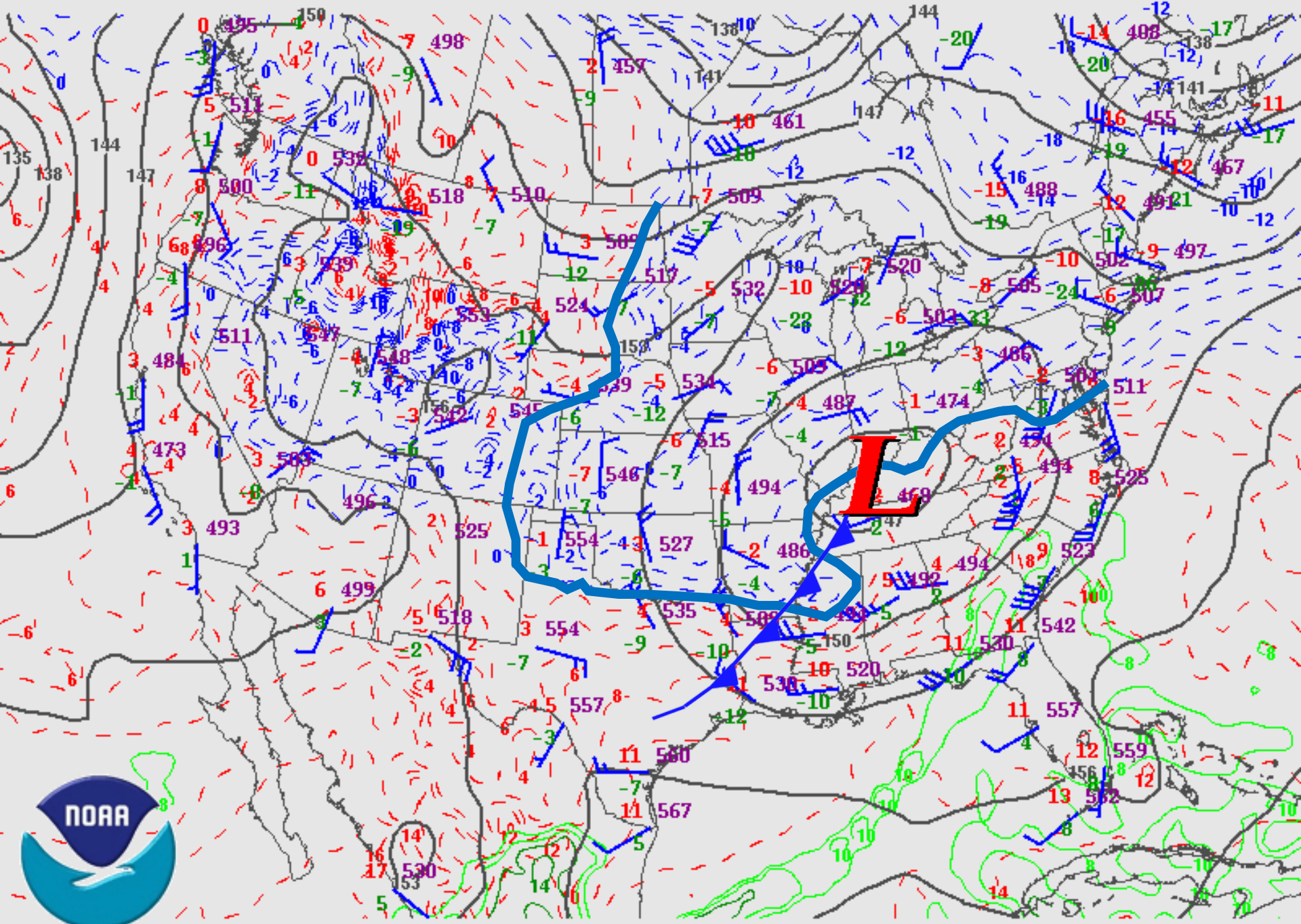
190113/1200 500 MB UA OBS, HGHTS, and TEMPS

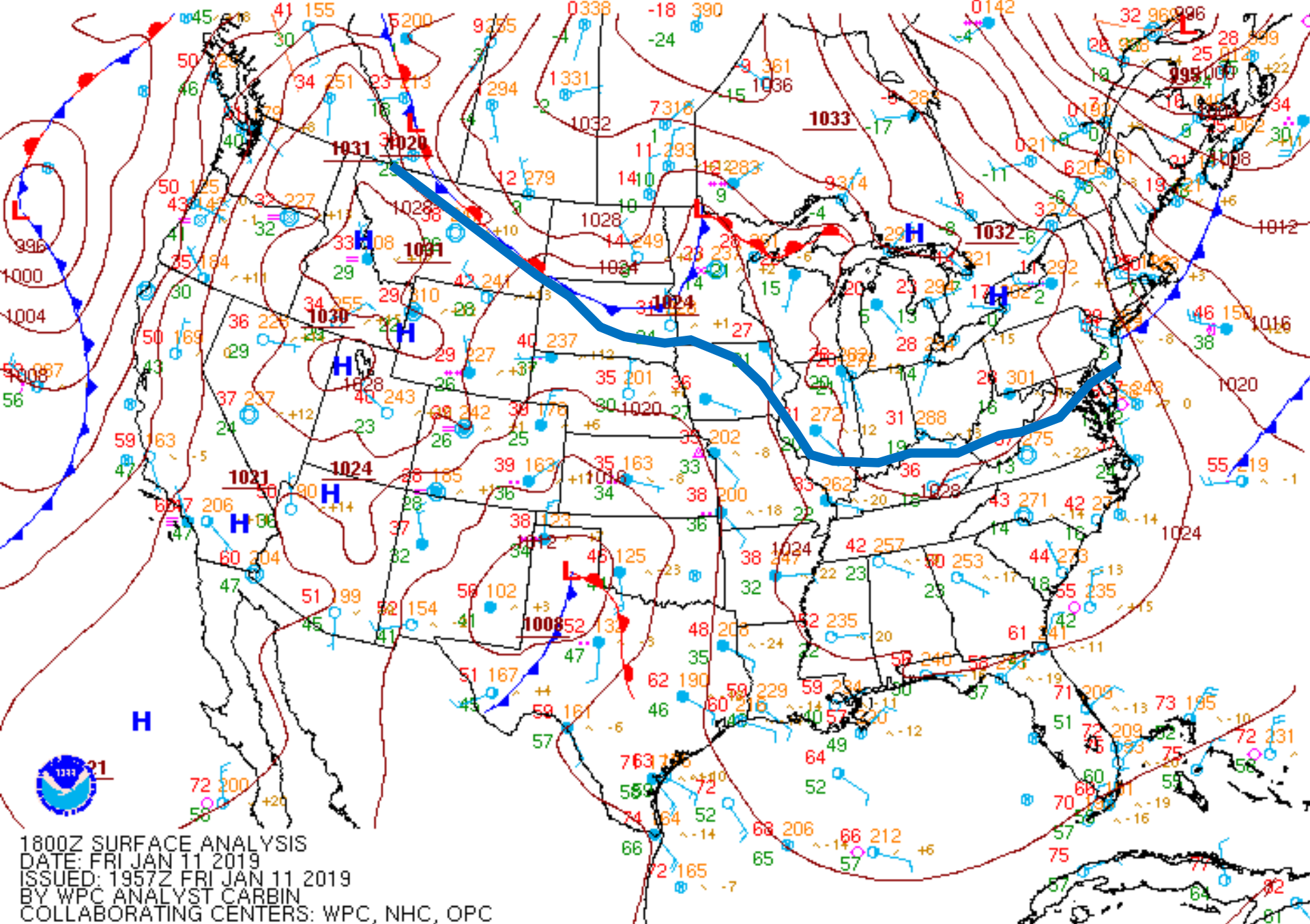


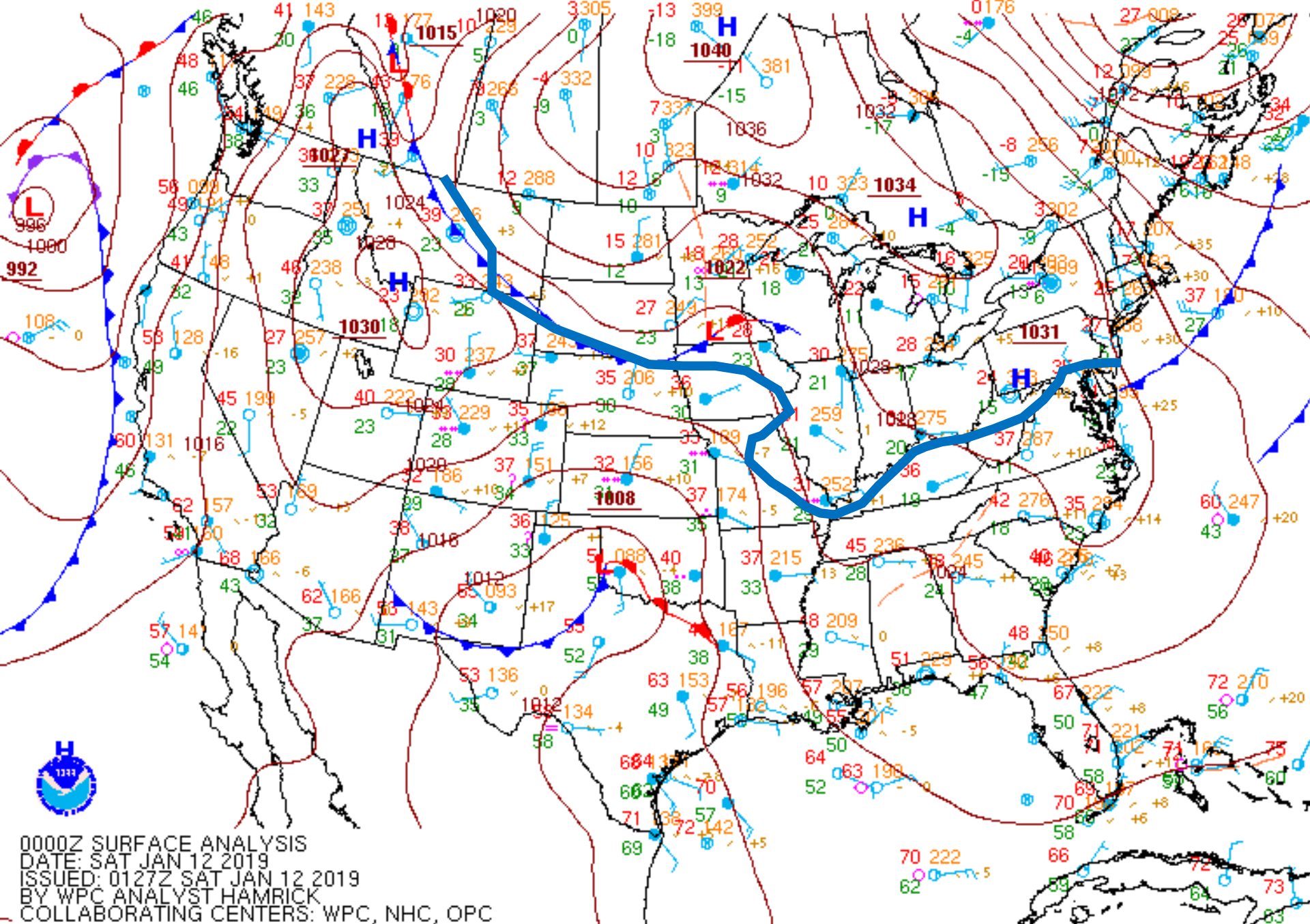




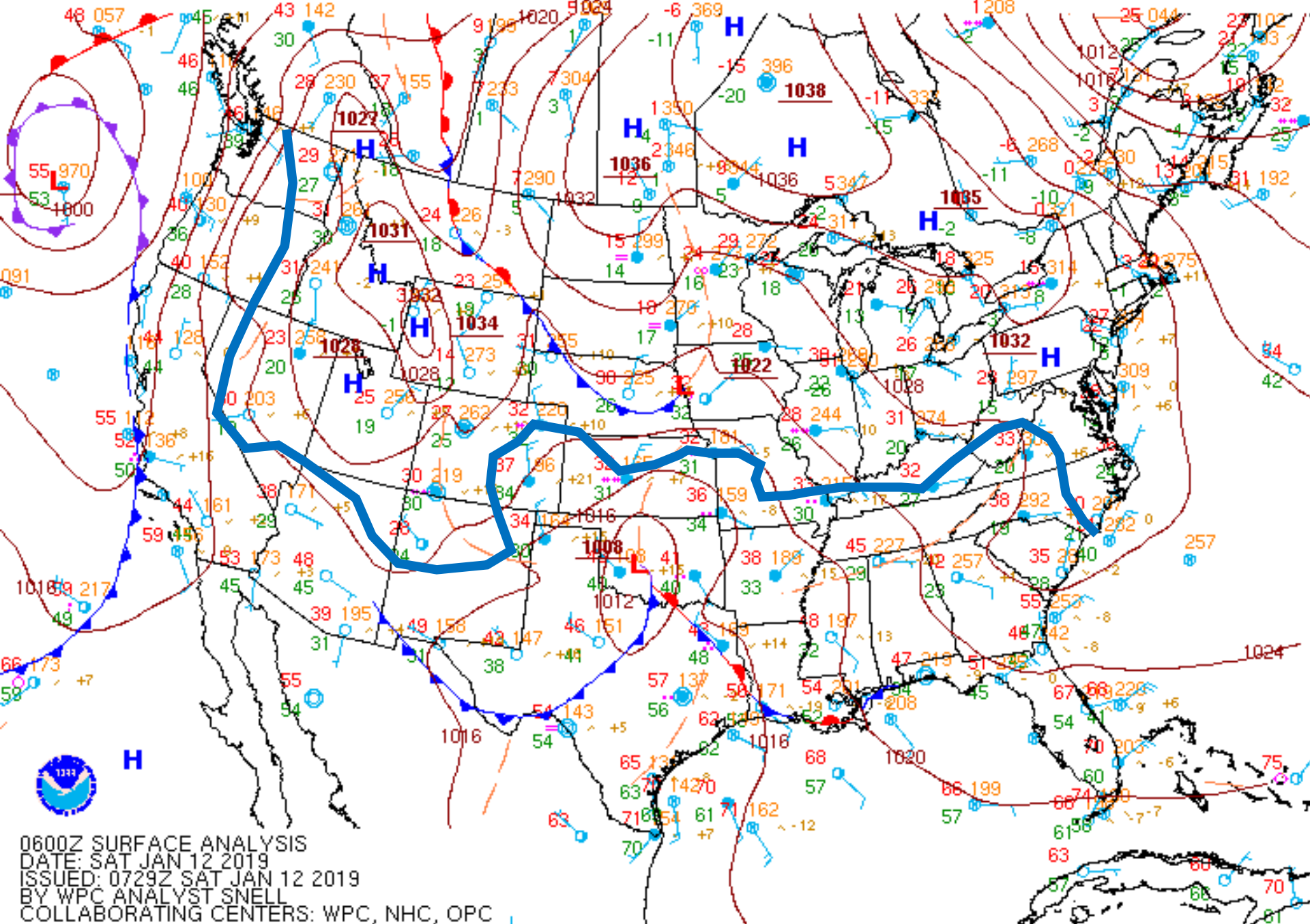


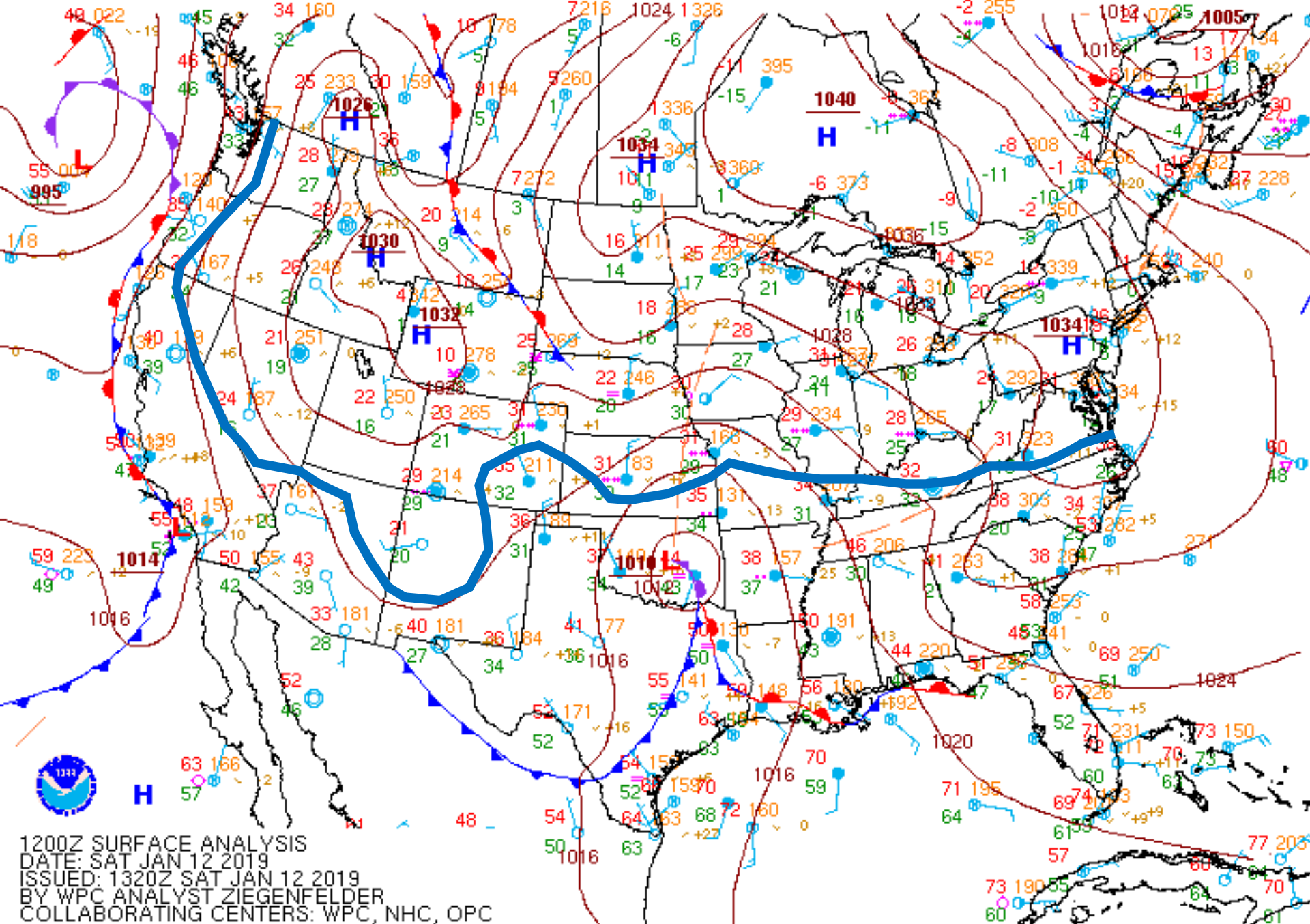




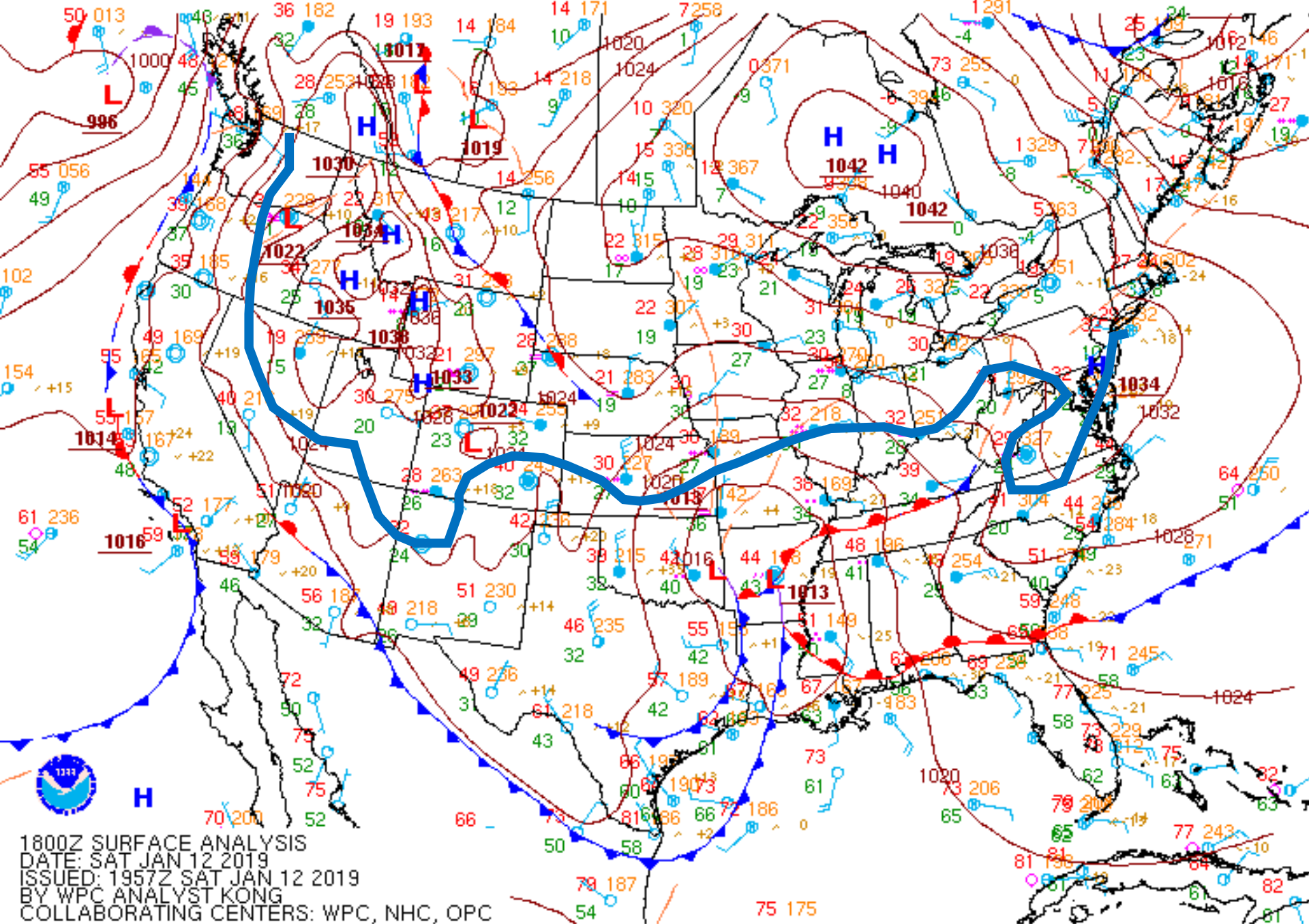


0000Z SURFACE ANALYSIS
DATE: SAT JAN 12 2019
ISSUED: 0127Z SAT JAN 12 2019
BY WPC ANALYST HAMRICK
COLLABORATING CENTERS: WPC, NHC, OPC

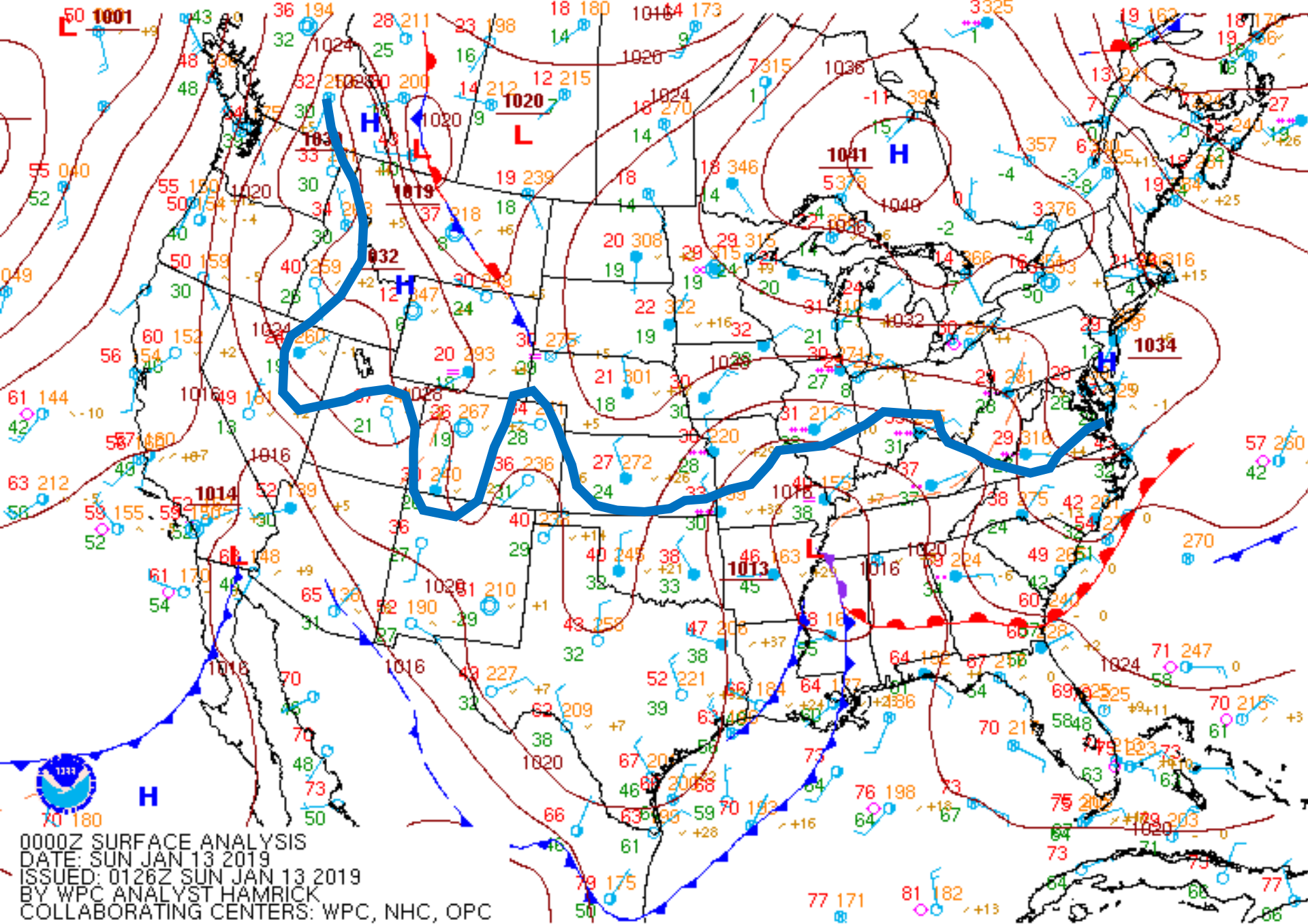


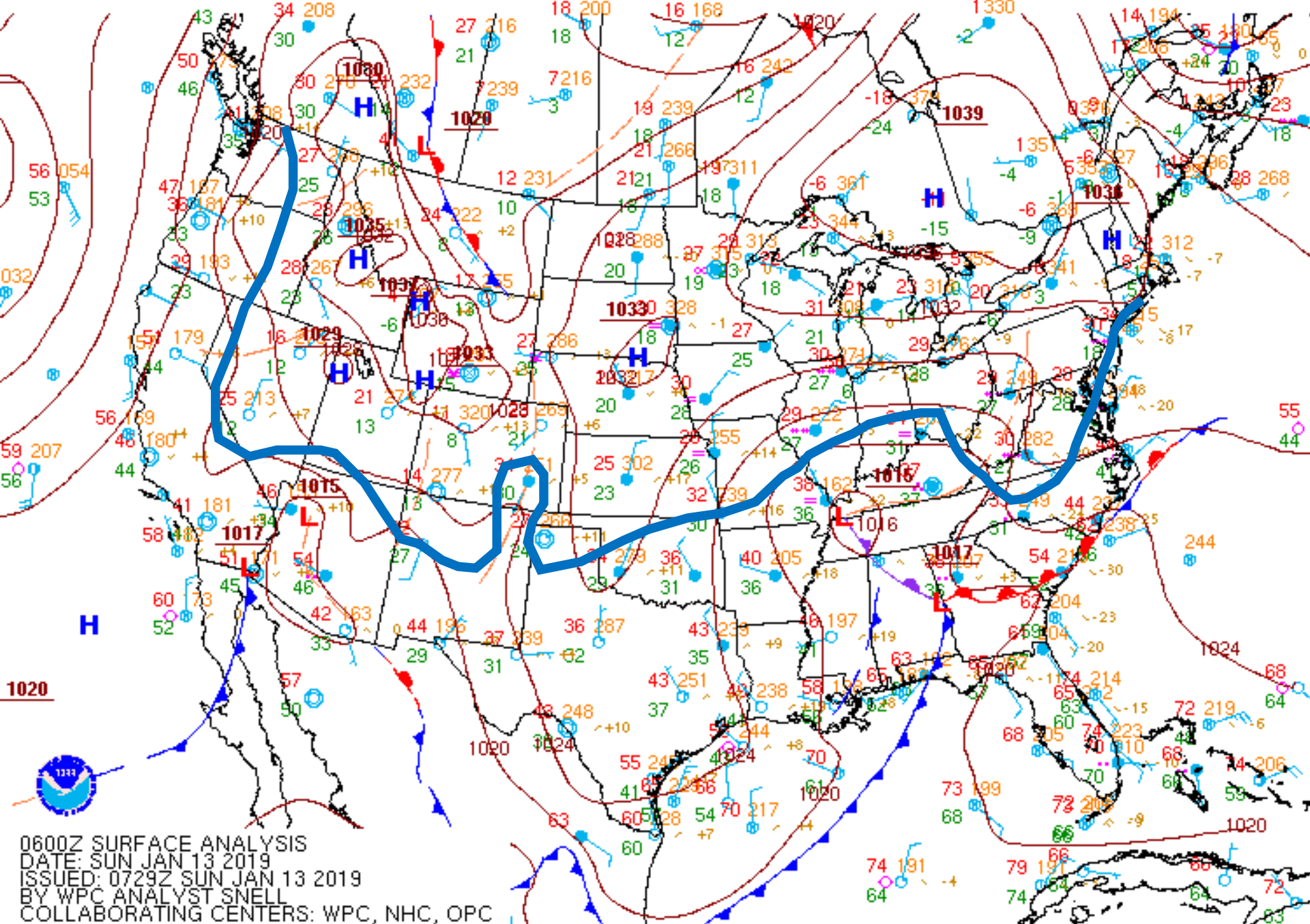


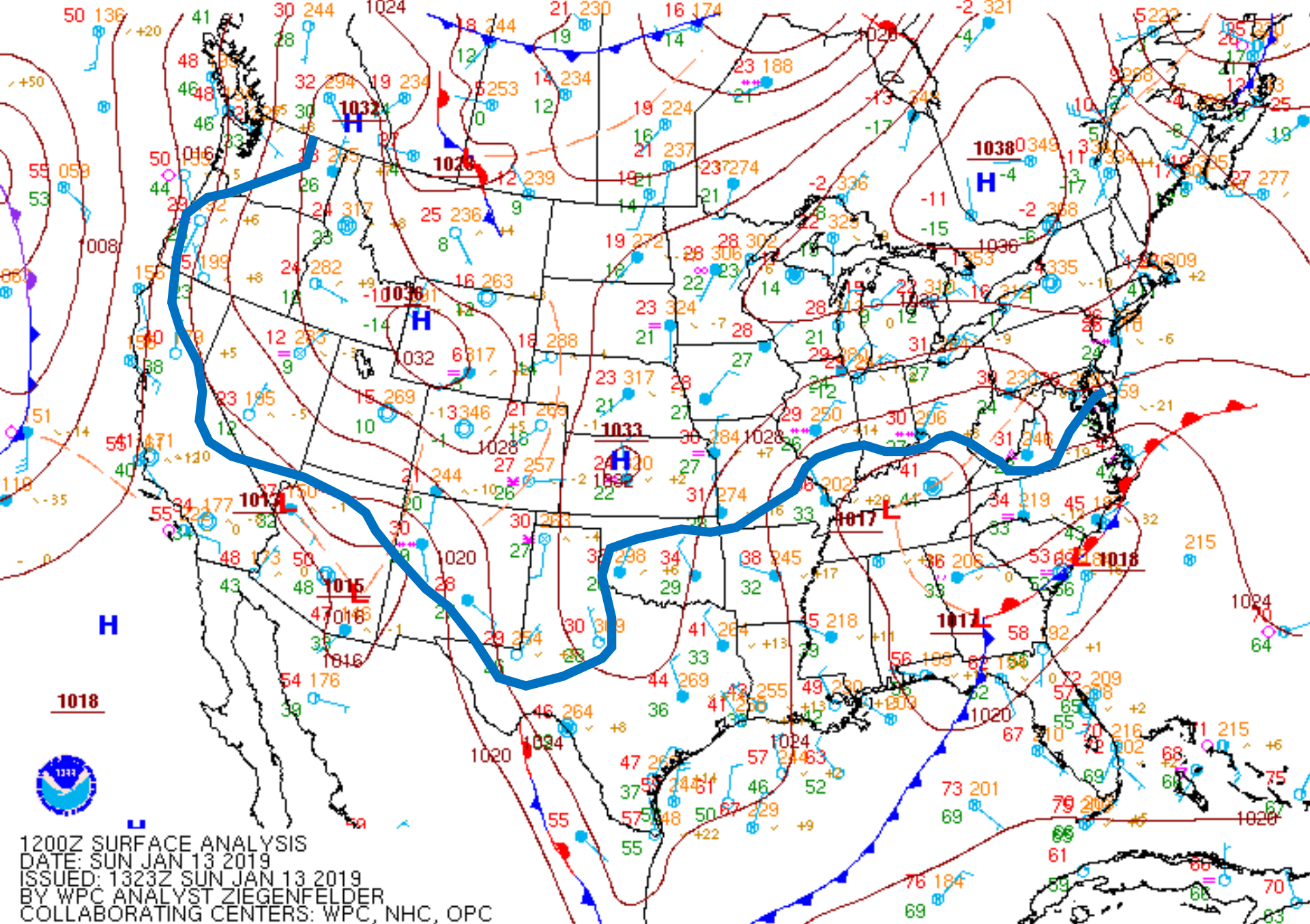
1200Z SURFACE ANALYSIS
DATE: SAT JAN 12 2019
ISSUED: 1320Z SAT JAN 12 2019
BY WPC ANALYST ZIEGENFELDER
COLLABORATING CENTERS: WPC, NHC, OPC



1800Z SURFACE ANALYSIS
DATE: SAT JAN 12 2019
ISSUED: 1957Z SAT JAN 12 2019
BY WPC ANALYST KONG
COLLABORATING CENTERS: WPC, NHC, OPC









6:00am Friday Radar

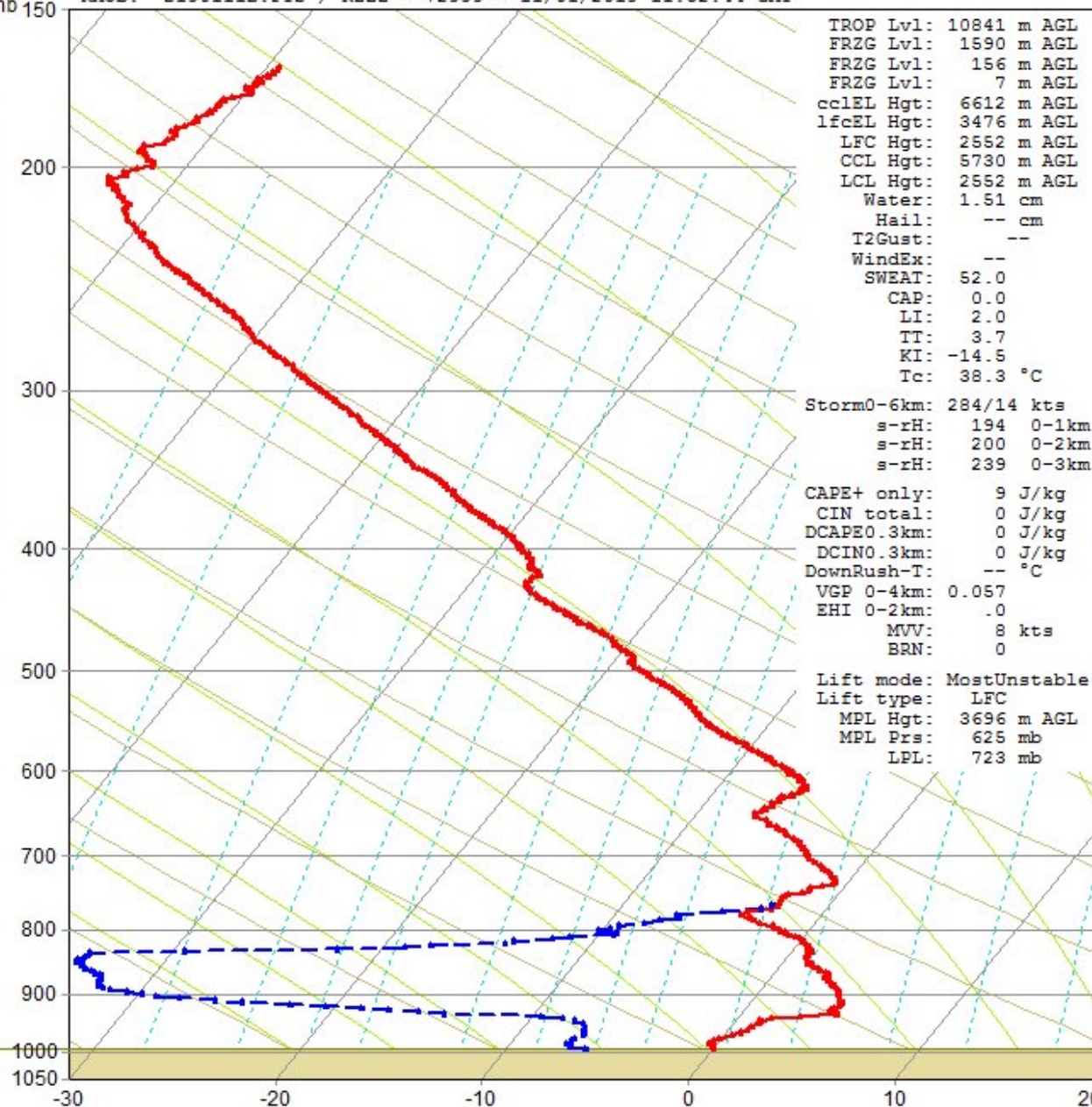


RAOB: S190111B.PYS / KZZZ - 72999 - 11/01/2019 11:52:44 GMT

KM FT (x1000)

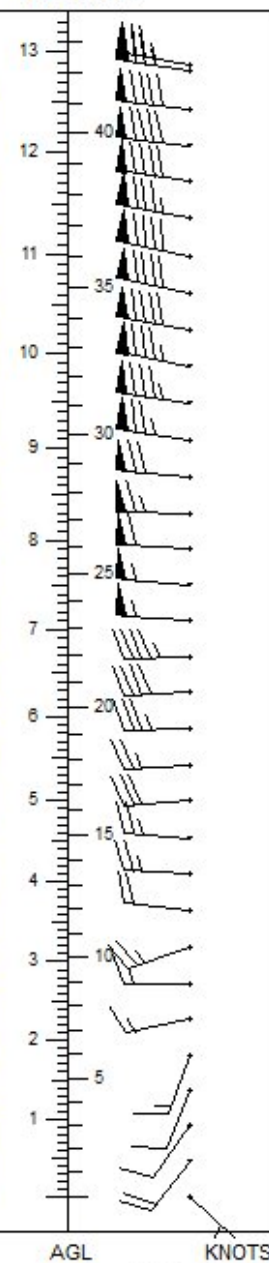
Parcel Data	
Pres:	
Hgt:	
(AGL)	
±Std:	
Temp:	
Td:	
T-Td:	
RH:	
PT:	
ePT:	
L.R.:	
Tmax:	
Wind:	
Hgt:	
(AGL)	

Diagram Data	
Pres:	
Hgt:	
(MSL)	
Hgt:	
(AGL)	
Temp:	
DryA:	
WetA:	
MixR:	



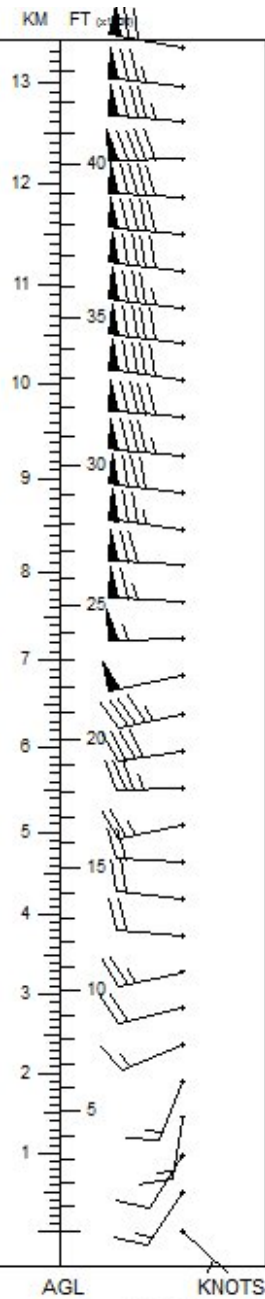
TROP Lvl: 10841 m AGL
FRZG Lvl: 1590 m AGL
FRZG Lvl: 156 m AGL
FRZG Lvl: 7 m AGL
cclEL Hgt: 6612 m AGL
lfcEL Hgt: 3476 m AGL
LFC Hgt: 2552 m AGL
CCL Hgt: 5730 m AGL
LCL Hgt: 2552 m AGL
Water: 1.51 cm
Hail: -- cm
T2Gust: --
WindEx: --
SWEAT: 52.0
CAP: 0.0
LI: 2.0
TT: 3.7
KI: -14.5
Tc: 38.3 °C
Storm0-6km: 284/14 kts
s-rH: 194 0-1km
s-rH: 200 0-2km
s-rH: 239 0-3km
CAPE+ only: 9 J/kg
CIN total: 0 J/kg
DCAPE0.3km: 0 J/kg
DCIN0.3km: 0 J/kg
DownRush-T: -- °C
VGP 0-4km: 0.057
EHI 0-2km: .0
MVV: 8 kts
BRN: 0

Lift mode: MostUnstable
Lift type: LFC
MPL Hgt: 3696 m AGL
MPL Prs: 625 mb
LPL: 723 mb



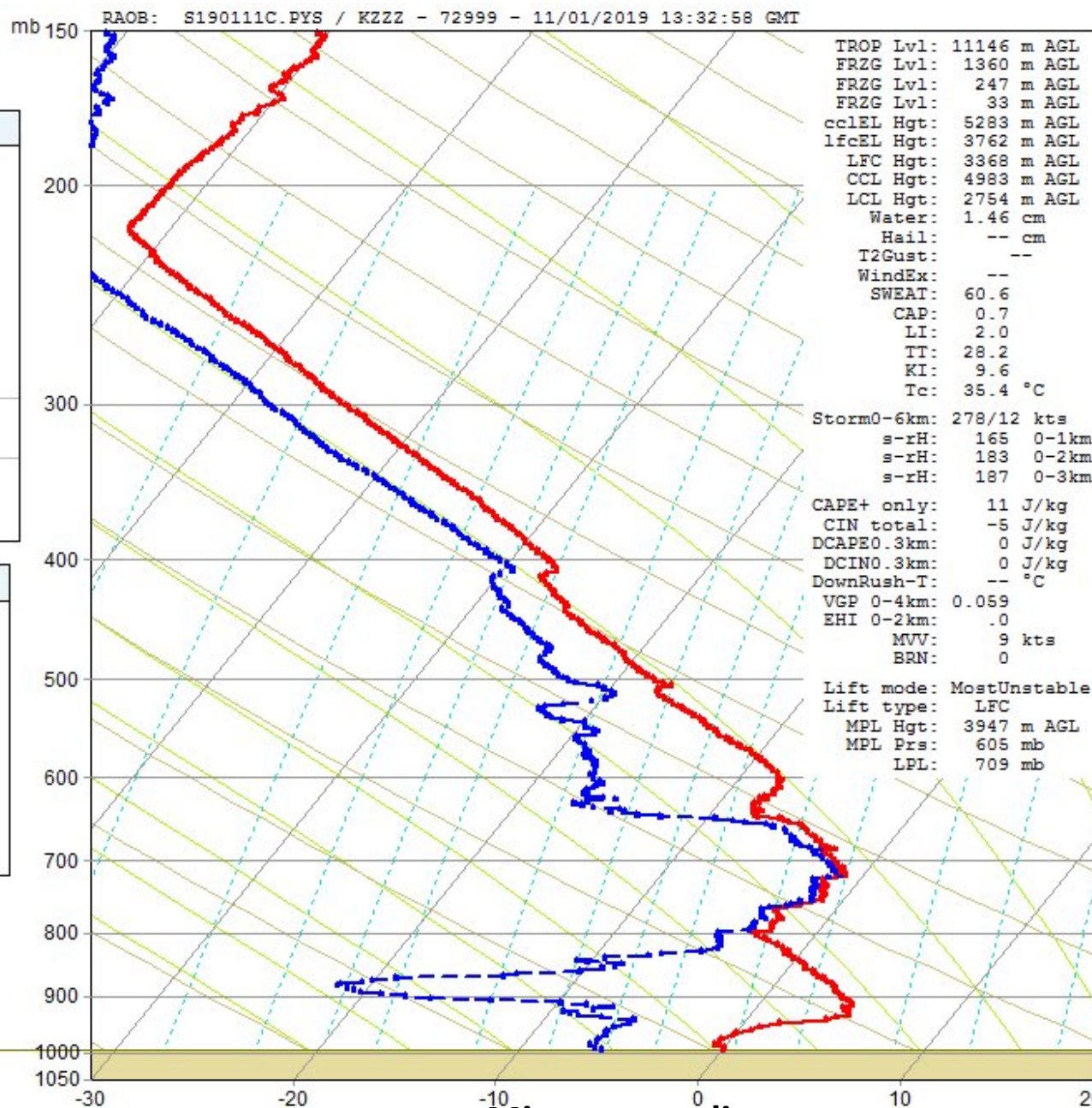
Mizzou sounding at
11:52 UTC 1/11

RAOB: S190111C.PYS / KZZZ - 72999 - 11/01/2019 13:32:58 GMT



TROP Lvl: 11146 m AGL
 FRZG Lvl: 1360 m AGL
 FRZG Lvl: 247 m AGL
 FRZG Lvl: 33 m AGL
 cclEL Hgt: 5283 m AGL
 lfcEL Hgt: 3762 m AGL
 LFC Hgt: 3368 m AGL
 CCL Hgt: 4983 m AGL
 LCL Hgt: 2754 m AGL
 Water: 1.46 cm
 Hail: -- cm
 T2Gust: --
 WindEx: --
 SWEAT: 60.6
 CAP: 0.7
 LI: 2.0
 TT: 28.2
 KI: 9.6
 Tc: 35.4 °C
 Storm0-6km: 278/12 kts
 s-rH: 165 0-1km
 s-rH: 183 0-2km
 s-rH: 187 0-3km
 CAPE+ only: 11 J/kg
 CIN total: -5 J/kg
 DCAPE0.3km: 0 J/kg
 DCIN0.3km: 0 J/kg
 DownRush-T: -- °C
 VGP 0-4km: 0.059
 EHI 0-2km: .0
 MVV: 9 kts
 BRN: 0

Lift mode: MostUnstable
 Lift type: LFC
 MPL Hgt: 3947 m AGL
 MPL Prs: 605 mb
 LPL: 709 mb



Stn Elev: 253 m
 QNH = 1022.9 mb
 DA: -331 m, ISA

Mizzou sounding at
 13:32 UTC 1/11

Plotted 33 of 397 winds

RAOB Config #1:

Parcel Data

Pres:
 Hgt:
 (AGL)
 ±Std:
 Temp:
 Td:
 T-Td:
 RH:
 PT:
 ePT:

L.R.:
 Tmax:

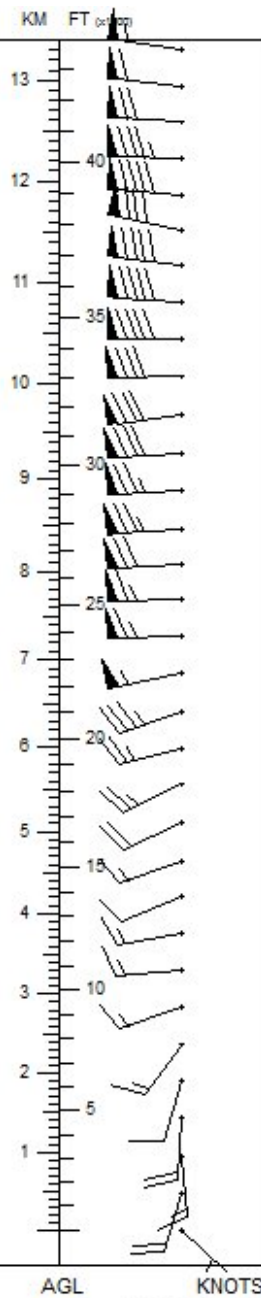
Wind:
 Hgt:
 (AGL)

Diagram Data

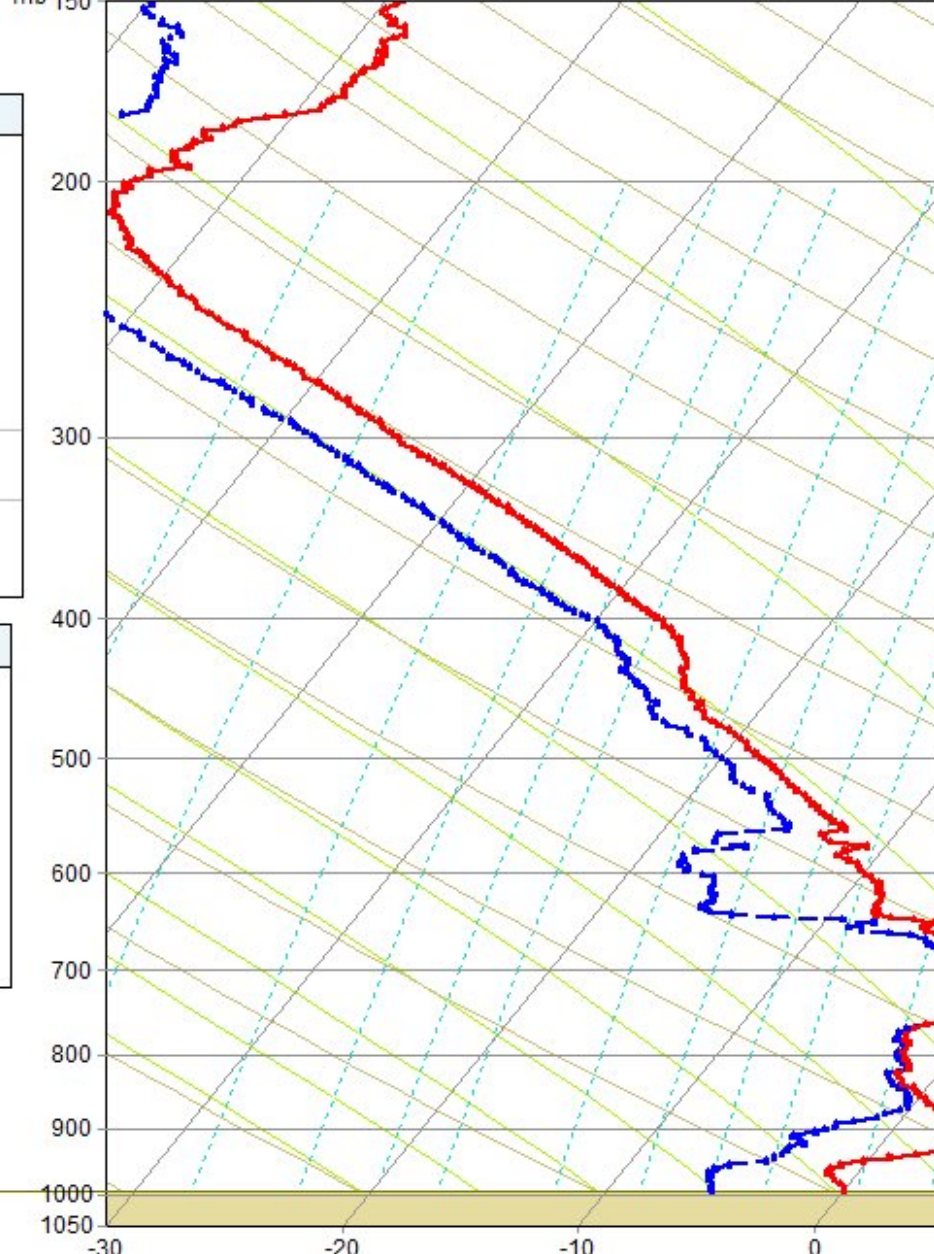
Pres:
 Hgt:
 (MSL)
 Hgt:
 (AGL)
 Temp:

DryA:
 WetA:
 MixR:

RAOB: S190111D.PYS / KZZZ - 72999 - 11/01/2019 15:33:34 GMT



TROP Lvl: 11489 m AGL
 FRZG Lvl: 1215 m AGL
 FRZG Lvl: 389 m AGL
 FRZG Lvl: 16 m AGL
 cclEL Hgt: 4271 m AGL
 lfcEL Hgt: 4514 m AGL
 LFC Hgt: 2684 m AGL
 CCL Hgt: 4093 m AGL
 LCL Hgt: 2676 m AGL
 Water: 1.80 cm
 Hail: -- cm
 T2Gust: --
 WindEx: --
 SWEAT: 181.4
 CAP: 0.0
 LI: 1.0
 TI: 35.4
 KI: 16.9
 Tc: 31.1 °C
 Storm0-6km: 254/10 kts
 s-rH: 122 0-1km
 s-rH: 127 0-2km
 s-rH: 155 0-3km
 CAPE+ only: 28 J/kg
 CIN total: -5 J/kg
 DCAPE0.3km: 0 J/kg
 DCIN0.3km: 0 J/kg
 DownRush-T: -- °C
 VGP 0-4km: 0.104
 EHI 0-2km: .0
 MVV: 14 kts
 BRN: 1
 Lift mode: MostUnstable
 Lift type: LFC
 MPL Hgt: 5219 m AGL
 MPL Prs: 512 mb
 LPL: 712 mb



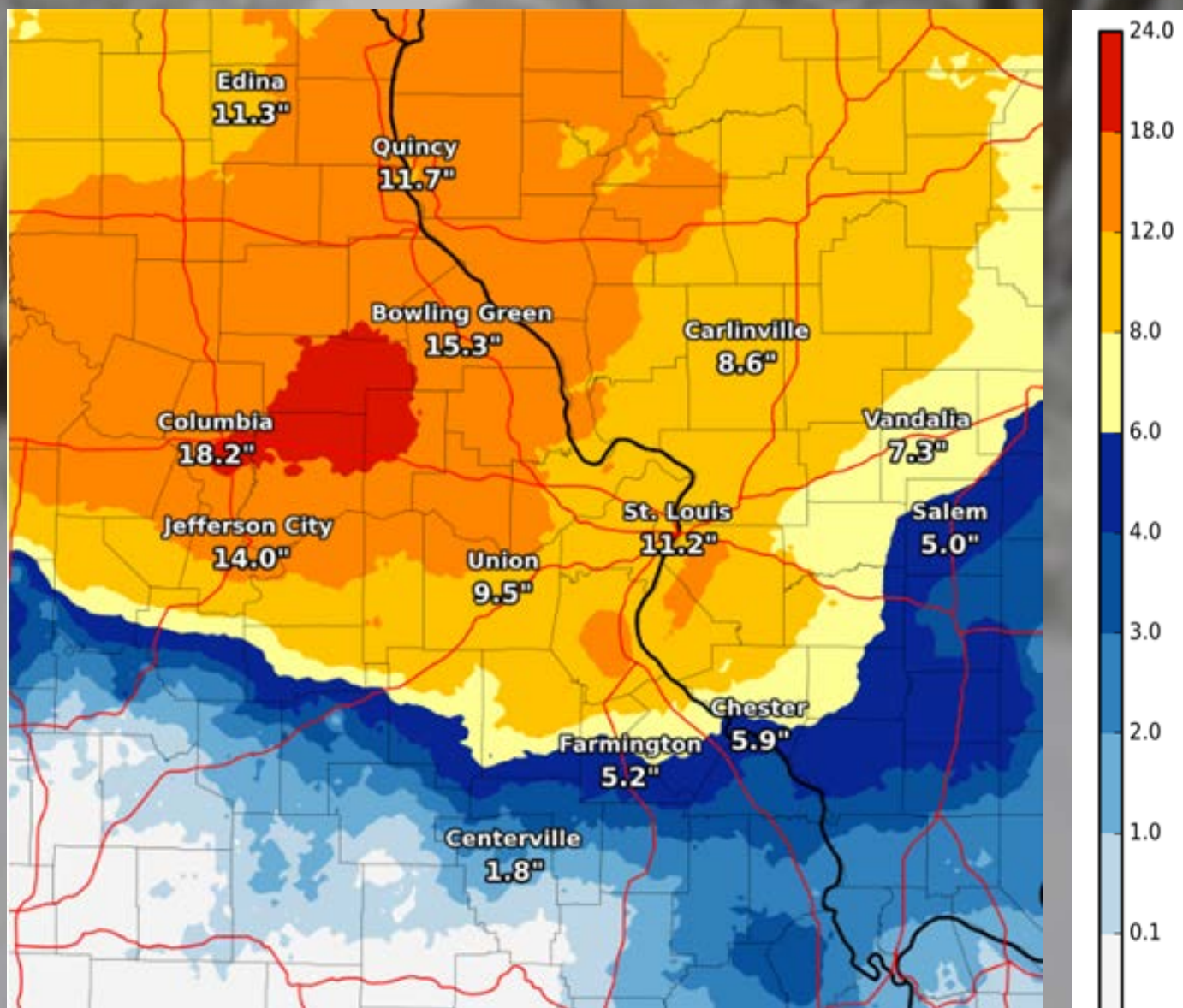
Stn Elev: 253 m
 QNH = 1023.2 mb
 DA: -334 m, ISA

Mizzou sounding at
 15:33 UTC 1/11

Storm Total Amounts

Reported Measurements:

Montgomery City	20.0"
Mexico	19.0"
Fulton	17.0"
Columbia Airport	16.9"
Bowling Green	16.5"
Jefferson City	15.0"
Foristell	15.0"
New London	14.0"
Quincy	12.0"
Ballwin	12.0"
St. Louis Airport	11.4"
DeSoto	11.2"
Union	10.5"



Historical Perspective

❖ Heaviest snowfall events (inches) at KCOU:

Ending date in parentheses.

KCOU

1. 19.7 (1995-01-20)

2. 18.0 (2011-02-03)

3. 16.9 (2019-01-12)

4. 15.3 (2006-12-01)

5. 13.9 (1900-03-01)

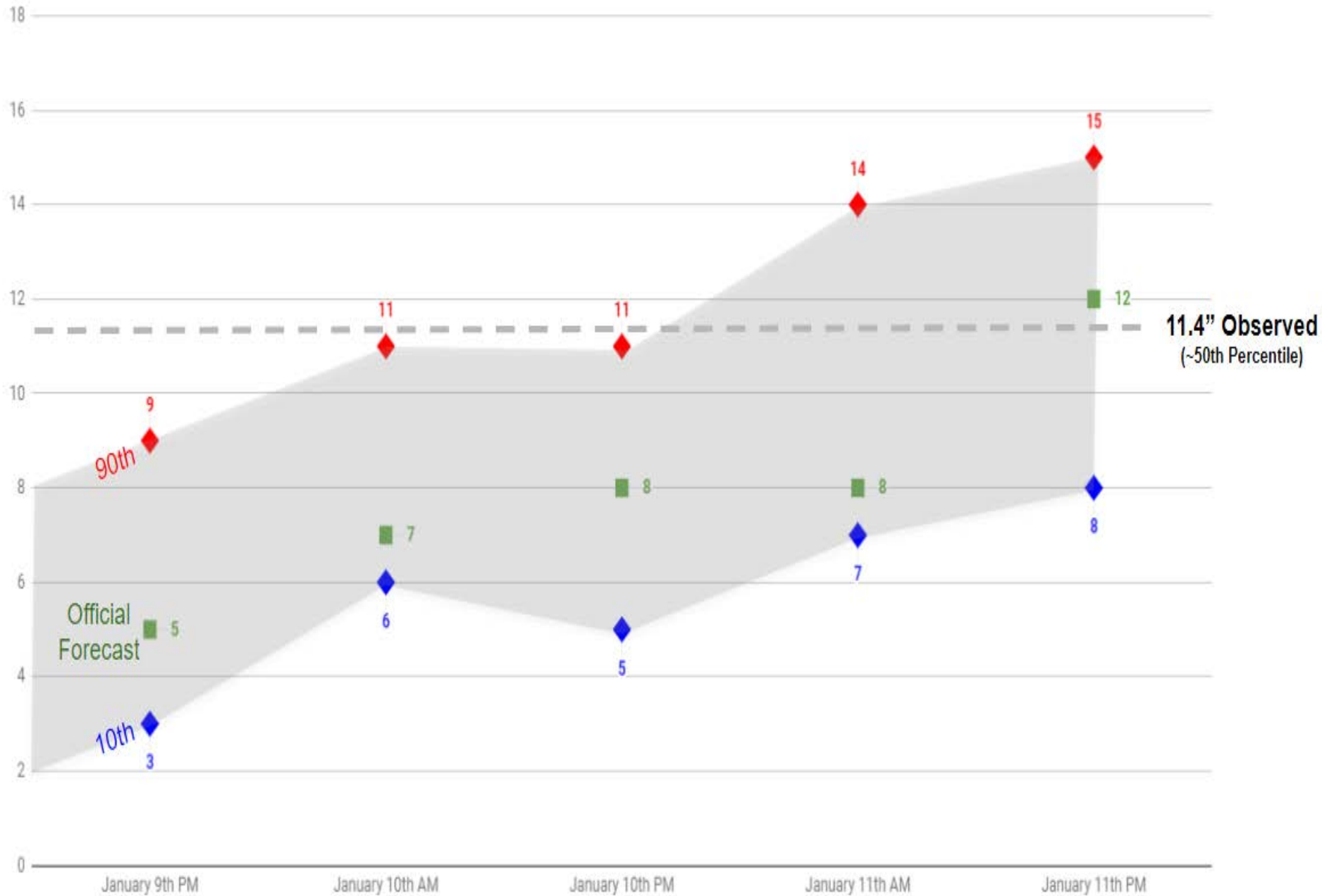
Recent History

- ❖ Comparing this event to the past 3 seasonal snowfall totals:

Time Period/Station	KSTL	KCOU
2015/16	10.9"	9.0"
2016/17	3.2"	1.6"
2017/18	7.1"	4.1"
15/16-17/18 TOTAL	21.2"	14.7"
1/11-1/13/2019	11.4"	16.9"

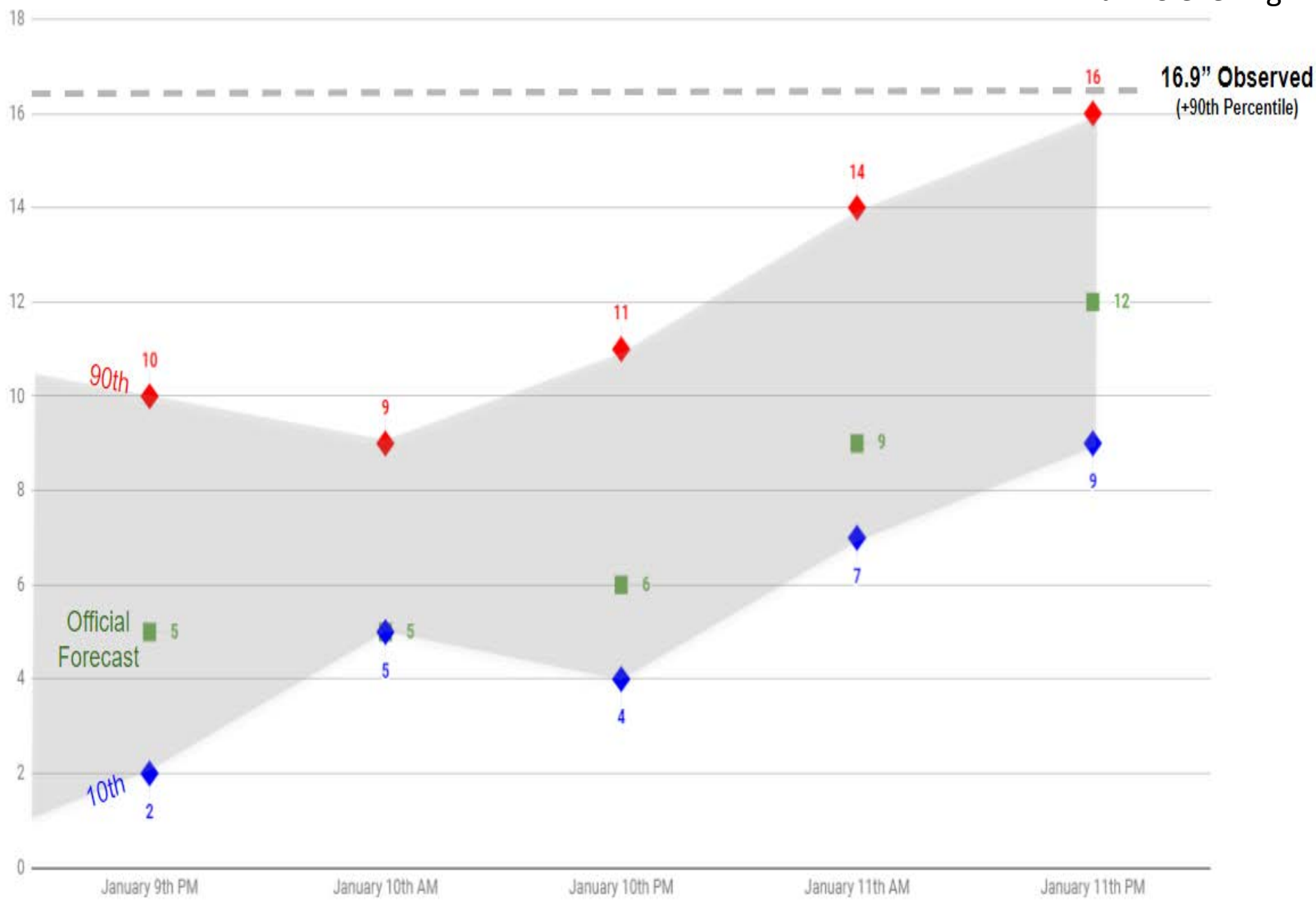
Probability of Snow - St. Louis, Missouri

Courtesy of:
Jim Sieveking



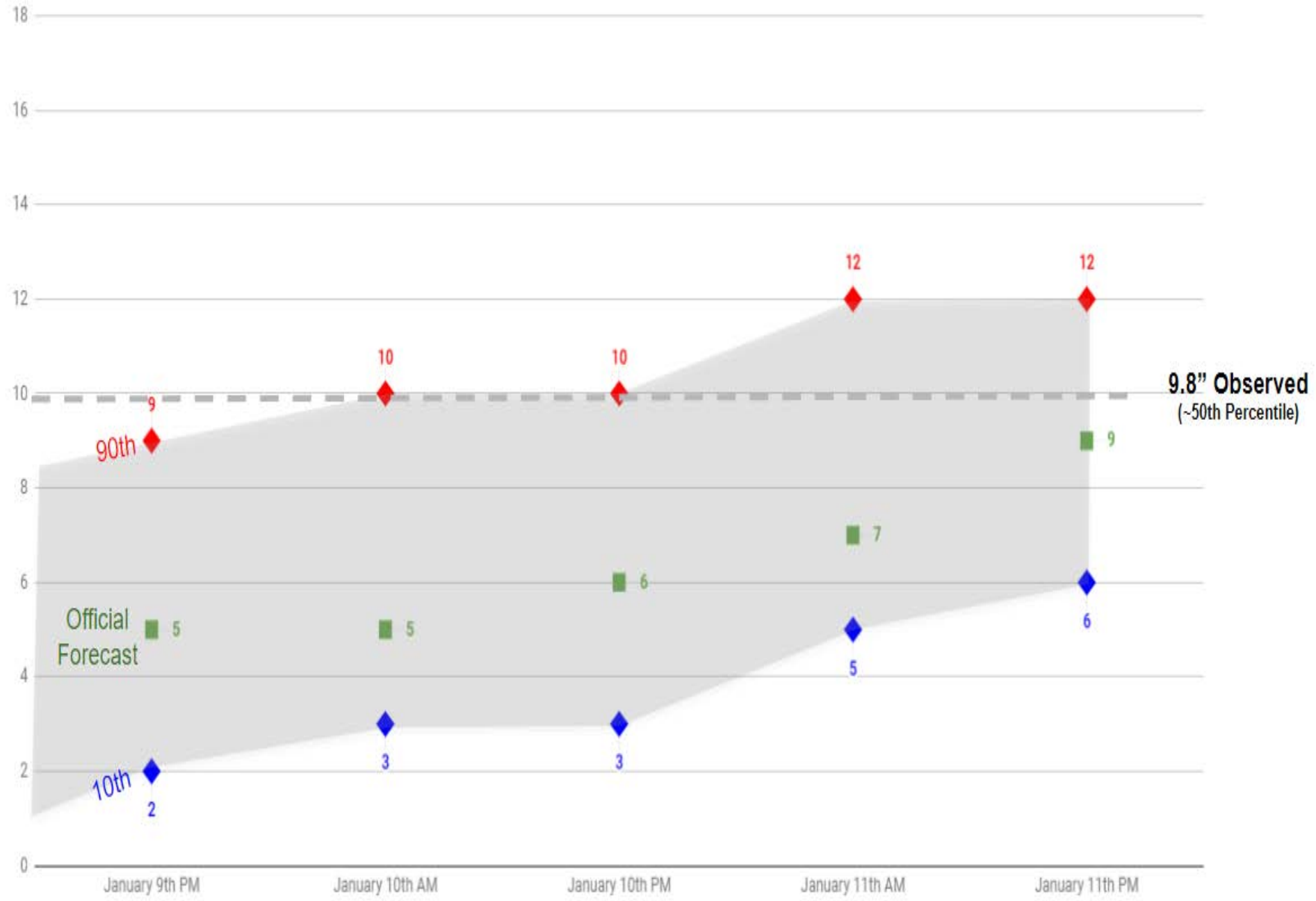
Probability of Snow - Columbia, Missouri

Courtesy of:
Jim Sieveking



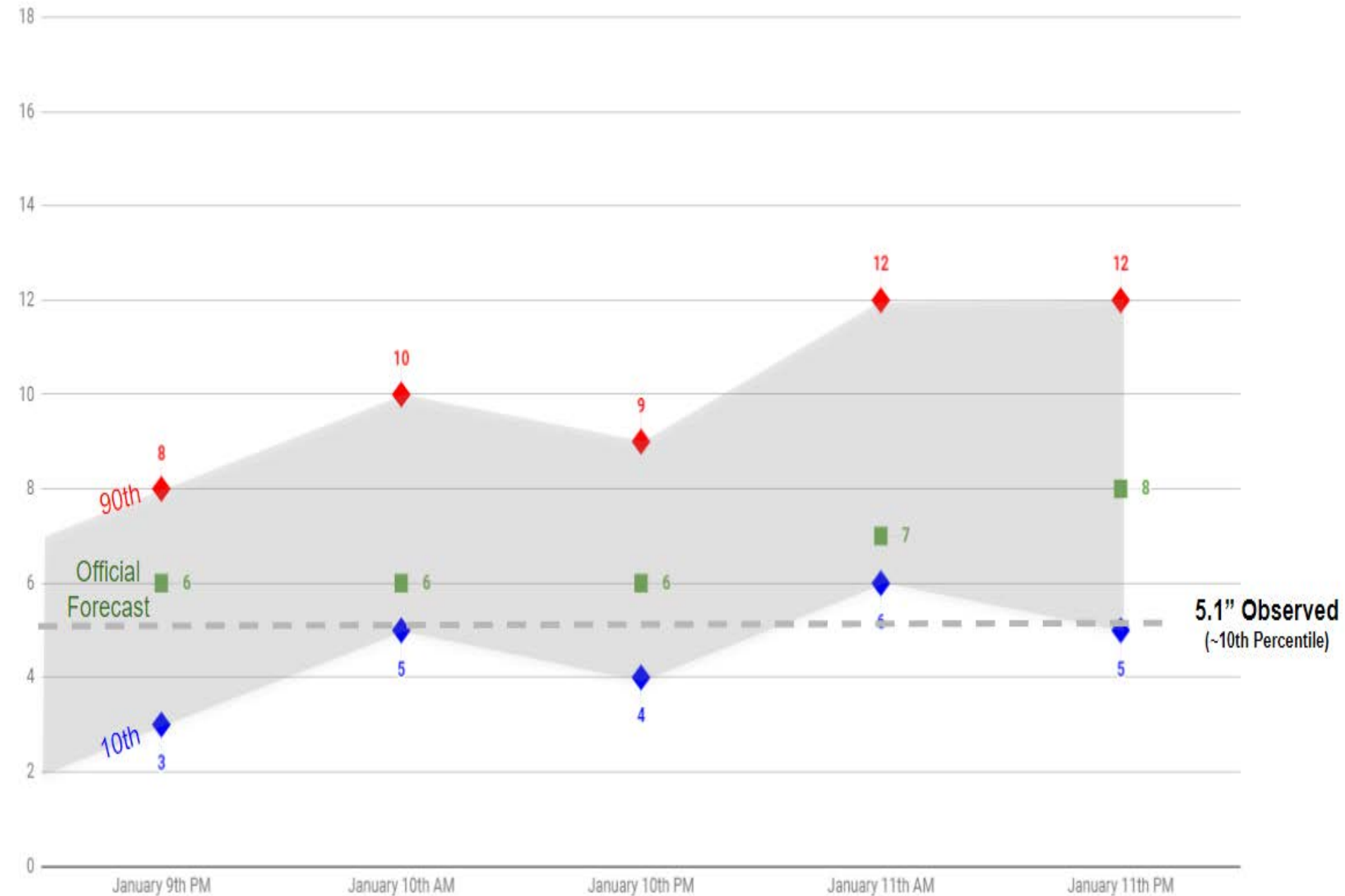
Probability of Snow - Quincy, Illinois

Courtesy of:
Jim Sieveking



Courtesy of:
Jim Sieveking

Probability of Snow - Farmington, Missouri



Conclusions

- ❖ First major winter storm experienced across most of area in 4 years.
 - ❖ Columbia's 3-day total (16.9") was more than the past 3 winters combined!
- ❖ Very high impactful winter storm
 - ❖ Due to heavy snowfall rates (1+"/hr) during evening rush hour on 1/11 as well as length of accumulating snow and snowfall totals
 - ❖ Impacts included: traffic accidents, extremely long commutes, flight cancellations, tree limbs down, power outages