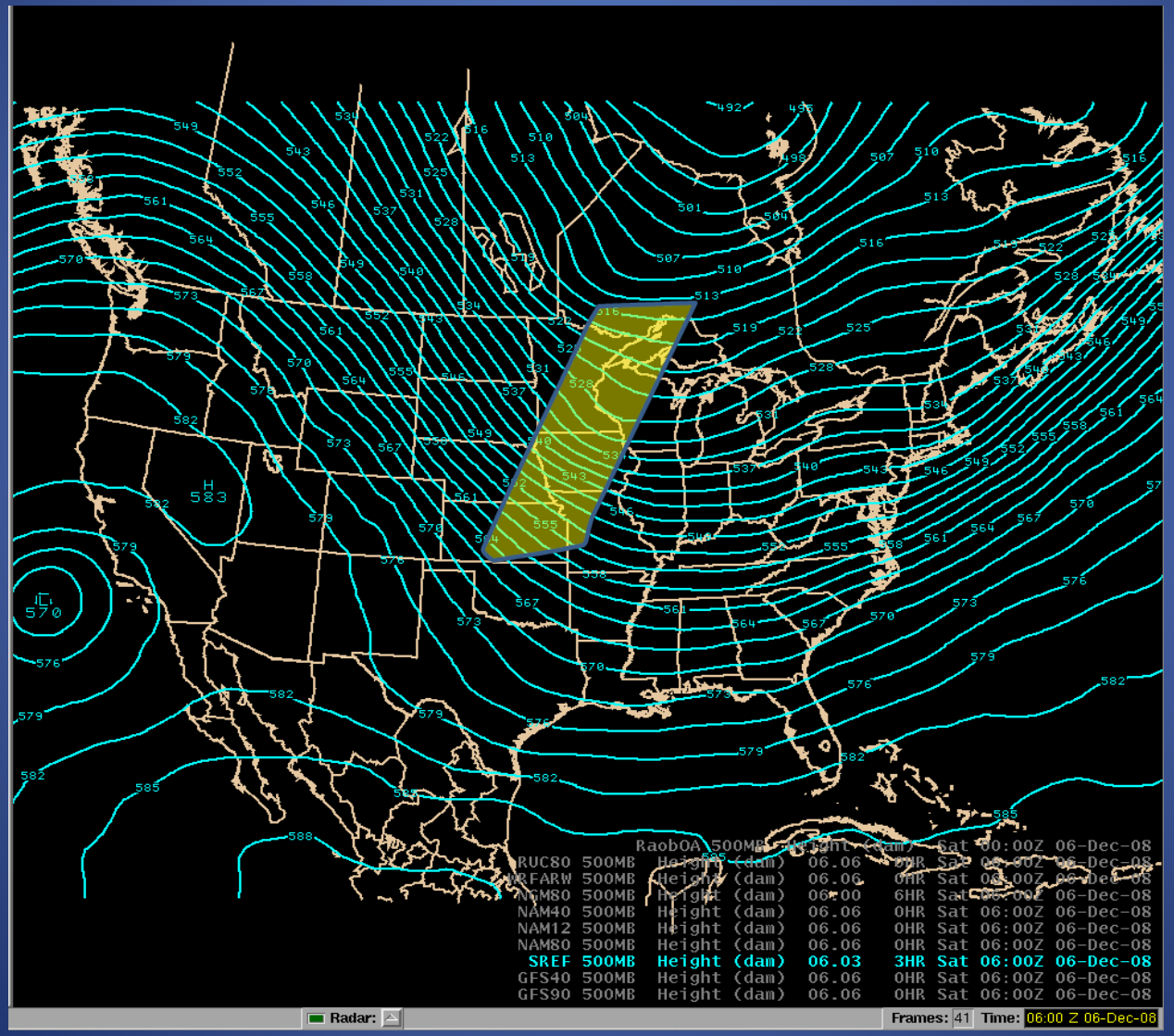
12-6-08 SNOW IFR CASE

DEC 6TH 2008 IFR SNOW

- IFR VIS CONDS DEVELOPED DURING THE EARLY MORNING OF SAT DEC 6TH DUE TO SNOW
- TRADITIONAL MOS GUIDANCE TOOLS DID POORLY BUT SOME SIGNALS WERE NOTED
- NWS DID FCST IFR VIS AT LAF WITH 6Z FCST. MVFR ELSEWHERE.
- IFR VIS CONDS DEVELOPED AT ALL SITES

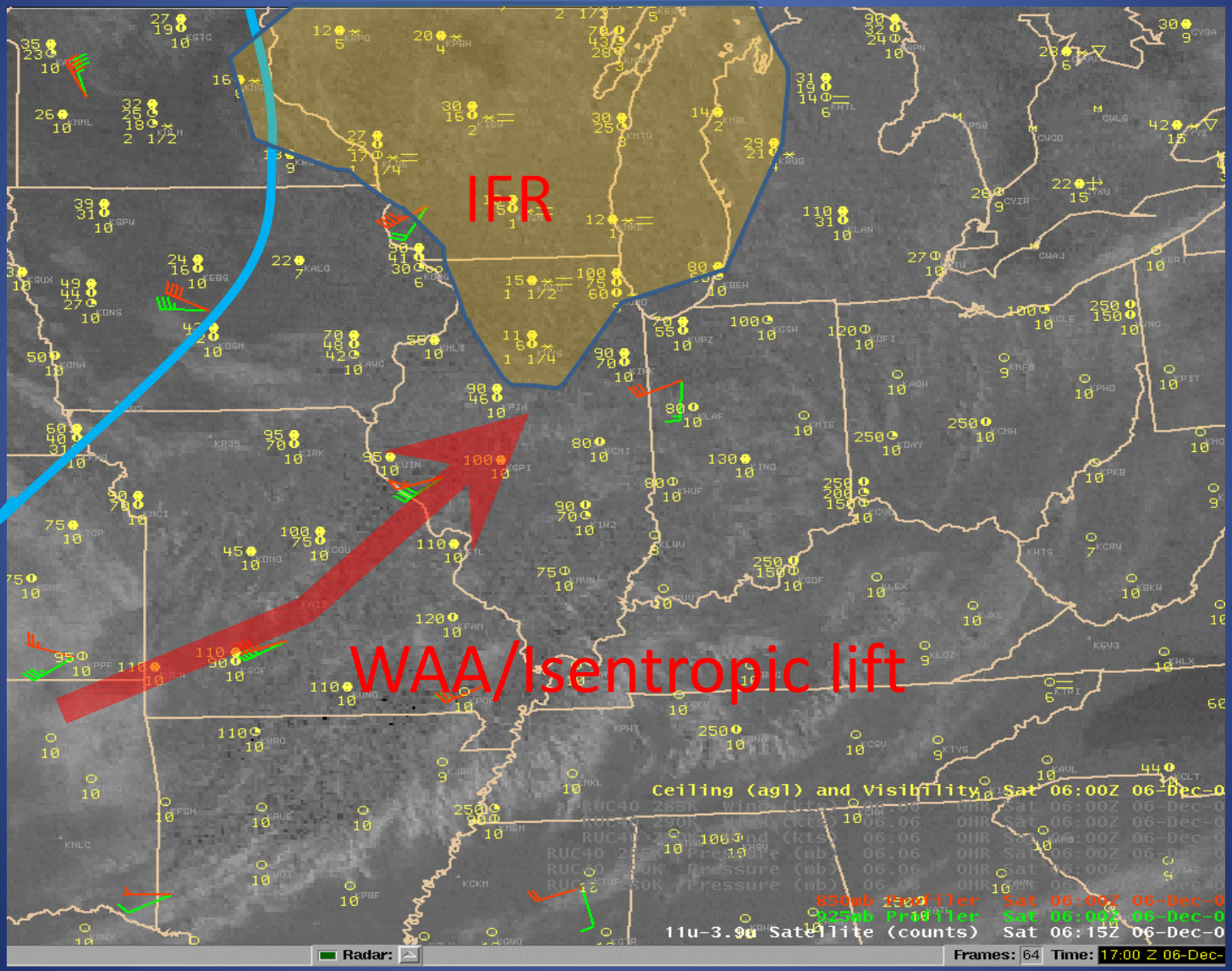
SYNOPTIC SETTING

Strong clipper system in nw flow aloft was approaching from the northern plains.



6Z SYNOPTIC SETTING

850MB cold front was across mn/ia. 850-925mb profilers (red-green) show 30-45kt sw flow ahead of the front. Obs show precip at 6z was limited to northern IL with vfr conds south. Vis conds within the precip area were ifr. Cigs too!



We will only look at MAV/MET MOS for IND for brevity. No traditional mos product captured this event but there were some signals of ifr potential. MET did fcst 1kft to 1.9kft cigs later in the day. The MAV did fcst one 3 hr time period of cat 4 vis conds at 15z which points to 2 to 3 mi VIS.

Guidance

Dec 06, 08 23:08 **Text 2: –2:METIND** Page 1/1

```
FOUS46 KIND 060000
KIND   ETA MOS GUIDANCE   12/06/2008  0000 UTC
DT /DEC   6            /DEC   7            /DEC   8            /
HR   06 09 12 15 18 21 00 03 06 09 12 15 18 21 00 03 06 09 12 18 00
X/N               33             14             26          19    38
TMP  22 22 23 26 31 30 25 21 19 17 15 17 23 25 23 23 23 21 21 35 36
DPT  11 14 16 19 20 21 19 16 16 14 12 11 12 14 15 16 16 16 16 22 26
CLD  BK OV OV OV OV OV OV OV OV SC CL SC SC BK BK OV OV OV OV BK OV
WDR  21 20 20 22 25 27 28 29 29 30 30 30 27 24 14 13 16 15 16 19 17
WSP  08 09 12 15 17 15 14 15 13 11 08 08 05 04 05 06 07 08 08 12 09
P06         1     32     10      2      0      0      0     10     12 15 17
P12               32             8             0          13    21
Q06         0      0      0      0      0      0      0      0      0  0  0
Q12               0              0             0          0     0
T06      0/ 3   0/ 0   1/ 1   0/24   0/ 0   0/ 0   0/ 0   0/16   0/ 0999/99
T12            1/ 3          1/25          0/ 0          0/18    999/99
SNW                                    0                          0
CIG   8  7  7  5  6  4  4  5  6  8  8  8  8  8  8  7  7  7  8  8  7
VIS   7  7  7  7  7  7  7  7  7  7  7  7  7  7  7  7  7  7  7  7  7
OBV   N  N  N  N  N  N  N  N  N  N  N  N  N  N  N  N  N  N  N  N  N
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Dec 06, 08 23:08 **Text 2: –3:MAVIND** Page 1/1

```
FOUS23 KIND 060000
KIND   GFS MOS GUIDANCE   12/06/2008  0000 UTC
DT /DEC   6            /DEC   7            /DEC   8            /
HR   06 09 12 15 18 21 00 03 06 09 12 15 18 21 00 03 06 09 12 18 00
X/N               34             15             30          18    37
TMP  24 25 26 28 31 30 27 23 21 18 16 19 26 29 25 23 21 21 21 33 34
DPT  13 16 19 20 19 18 16 15 14 12 10  9 10 11 12 12 12 13 14 24 25
CLD  OV OV OV OV OV OV OV OV OV SC BK FW BK BK OV OV OV OV OV OV OV
WDR  19 20 20 21 24 26 29 30 30 30 30 30 27 26 14 14 14 14 14 17 16
WSP  09 11 14 15 17 16 16 17 16 13 10 08 06 05 04 05 07 08 10 12 10
P06         22     50     13      0      0      1      0      2     13 19 27
P12               50             0             0          15    27
Q06         0      1      0      0      0      0      0      0      0  0  0
Q12               1              0             0          0     0
T06      1/ 0   0/ 0   0/ 0   0/40   0/ 0   0/ 0   0/ 4   0/32   0/ 0   0/ 0
T12            1/ 0          1/40          0/ 0          1/32    2/ 0
POZ  10  3  3  0  3  0  2  3  0  0  0  0  0  0  2  8 10 14  9 67 47
POS  87 98 97 99 97100 99 97 99 99 95 98 99 99 97 92 89 78 77 15 33
TYP   S  S  S  S  S  S  S  S  S  S  S  S  S  S  S  S  S  S  Z  Z
SNW                                    0                          0
CIG   7  7  6  5  5  5  5  5  6  6  6  8  8  8  8  7  7  7  8  8  7
VIS   7  7  7  4  7  7  7  7  7  7  7  7  7  7  7  7  7  7  7  7  7
OBV   N  N  N  N  N  N  N  N  N  N  N  N  N  N  N  N  N  N  N  N  N
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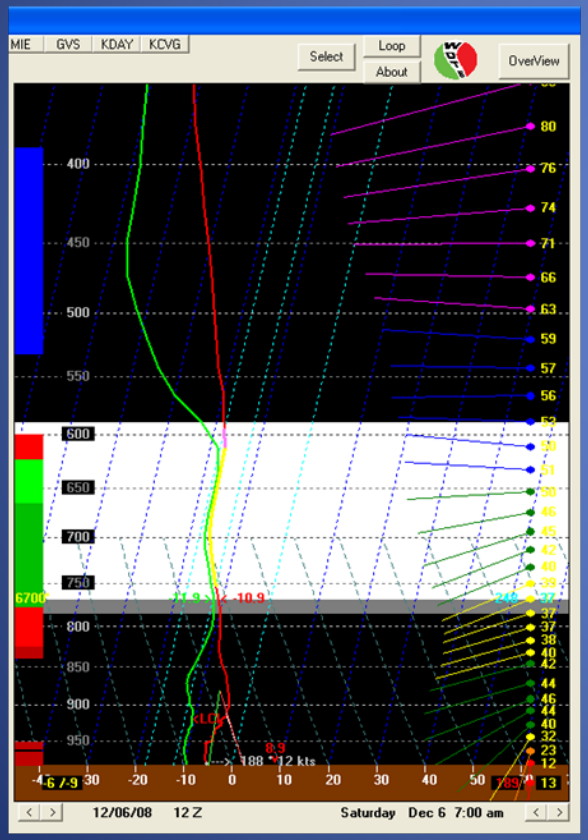
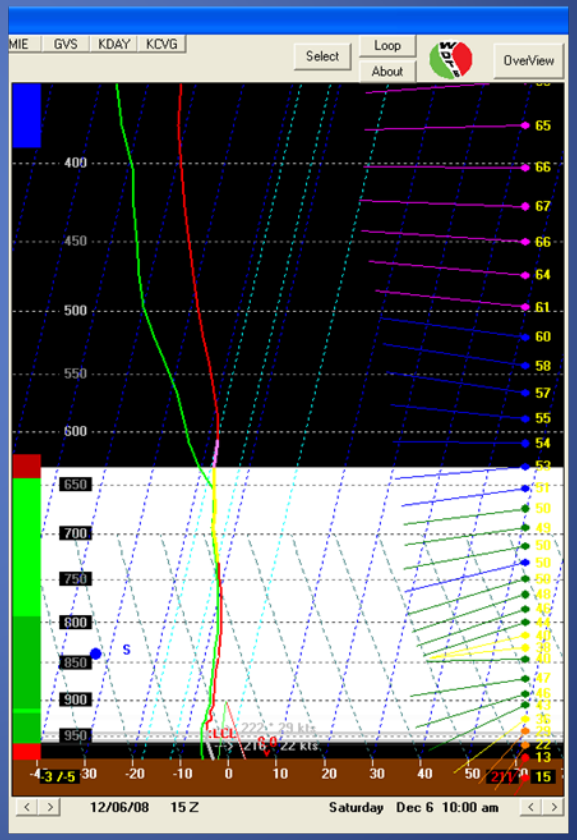
Guidance

IND BUFKIT VALID 12Z

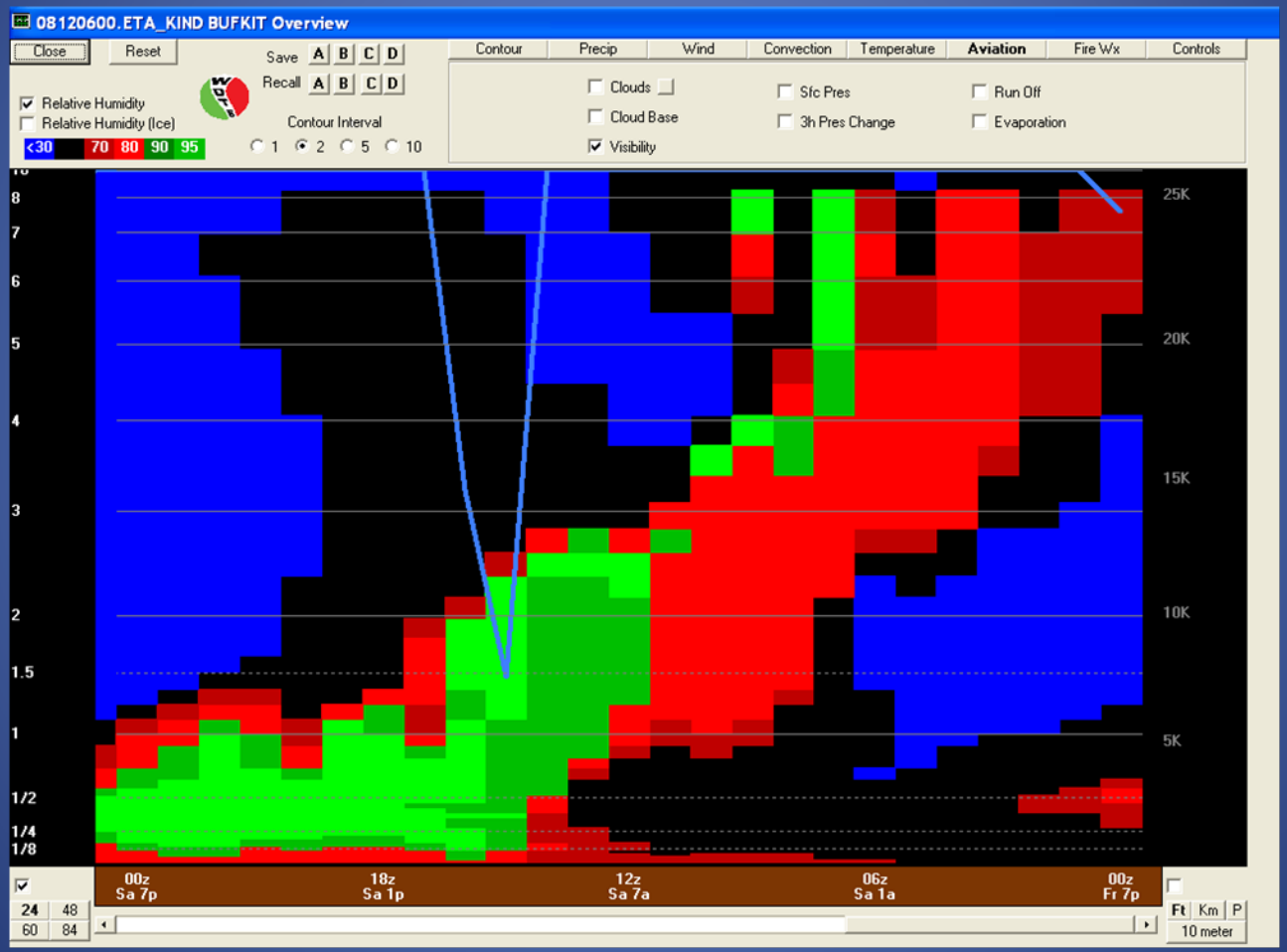


IND BUFKIT VALID 15Z



NAM SUGGESTS PRECIP DEVELOPING WITH CIGS LOWERING TO NEAR 1000 FT BY 15Z. What does nam bufkit vis fcst show?

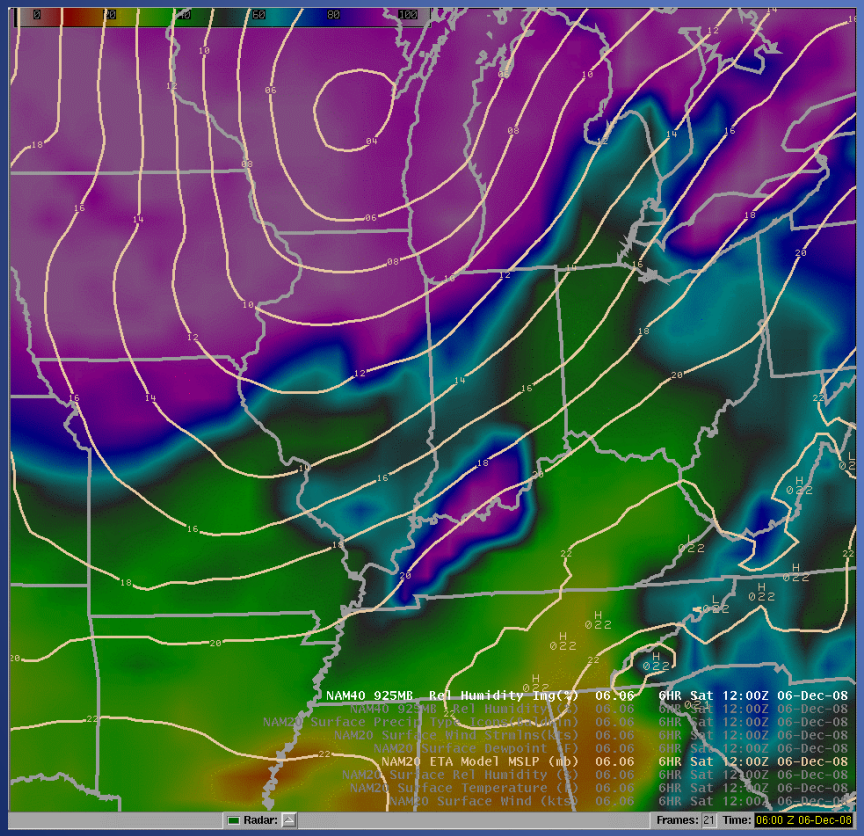
GUIDANCE



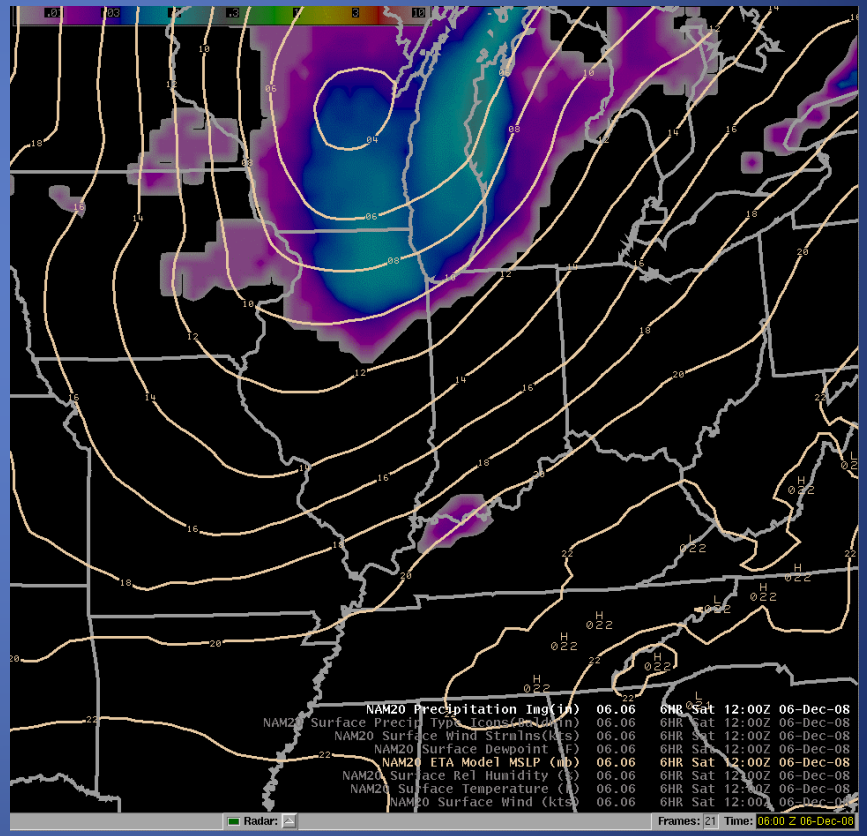
NAM BUFKIT GUIDANCE ACTUALLY DOES SHOW A PERIOD OF IFR VIS CONDS DEVELOPING BY AROUND 15Z DESPITE THE ETA MOS NOT SHOWING ANY IFR CONDS. THIS IS BASED OFF OF THE 6Z GUIDANCE.

GUIDANCE VALID 12Z

NAM 925MB RH



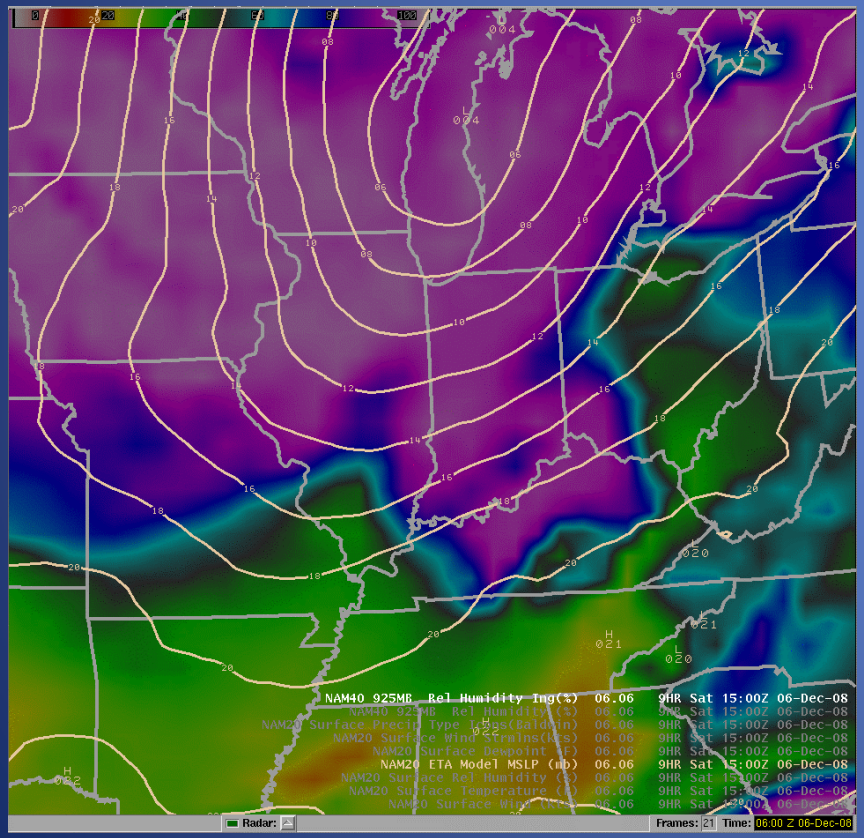
NAM SFC PRECIP



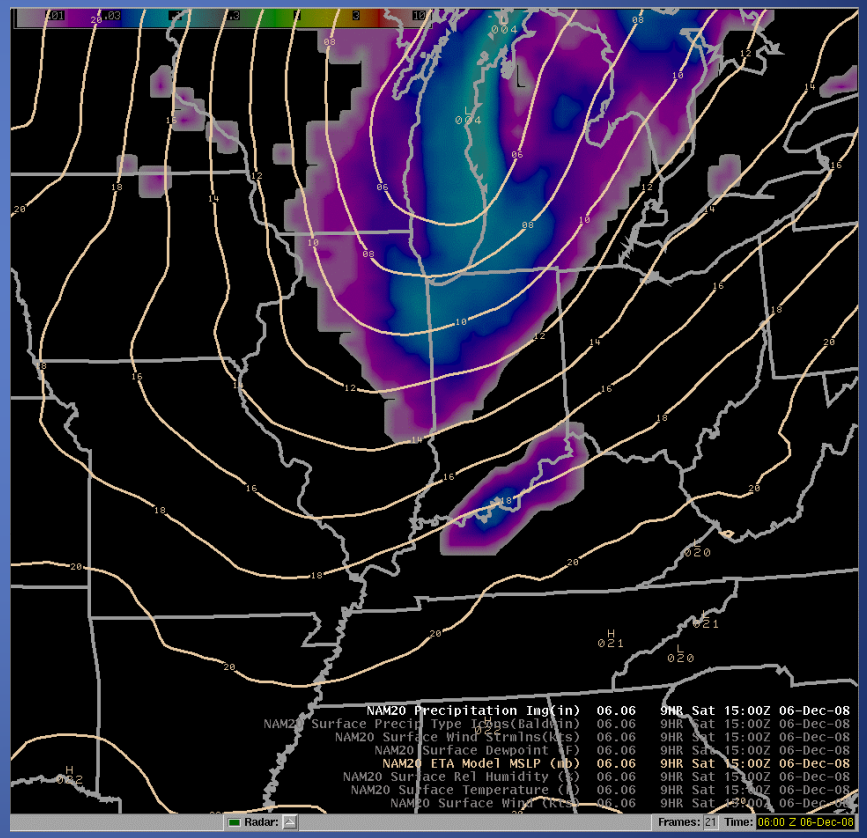
NAM SAYS DRY UNTIL 12Z TO 15Z

GUIDANCE VALID 15Z

NAM 925MB RH



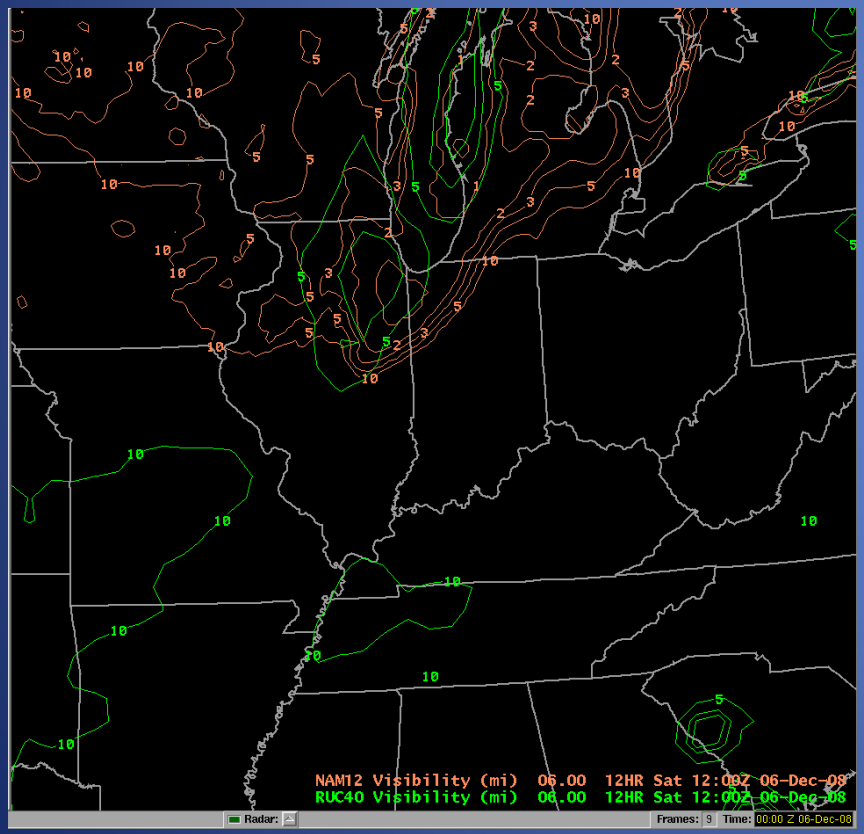
NAM SFC PRECIP



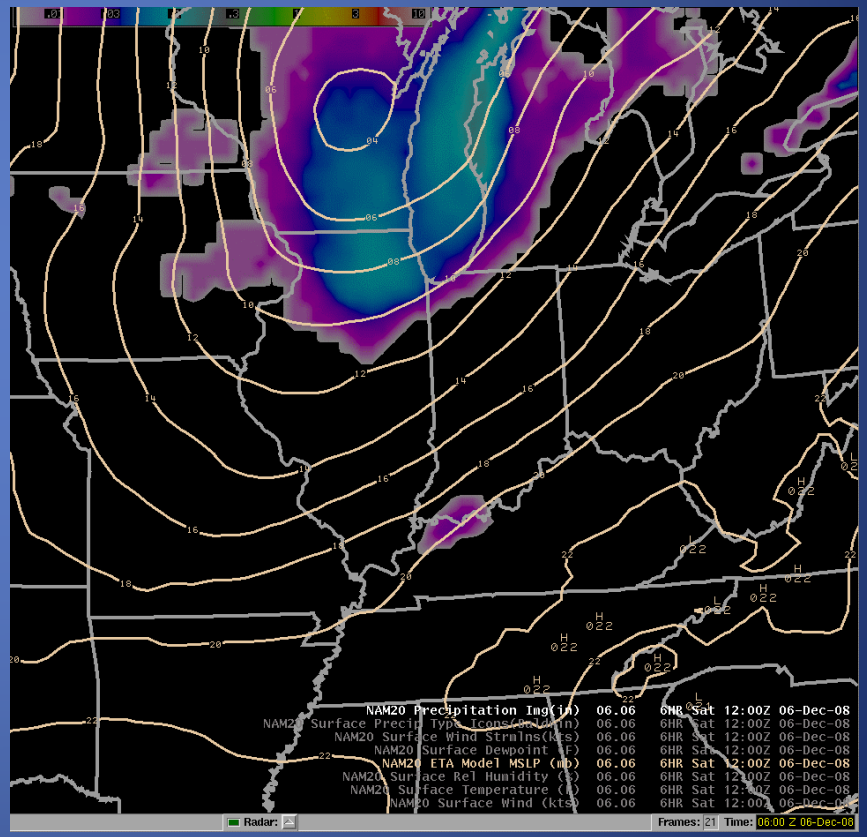
NAM IS TOO DRY WITH PRECIP

GUIDANCE NAM/RUC VIS FCST

Nam/ruc 12z vis fcst

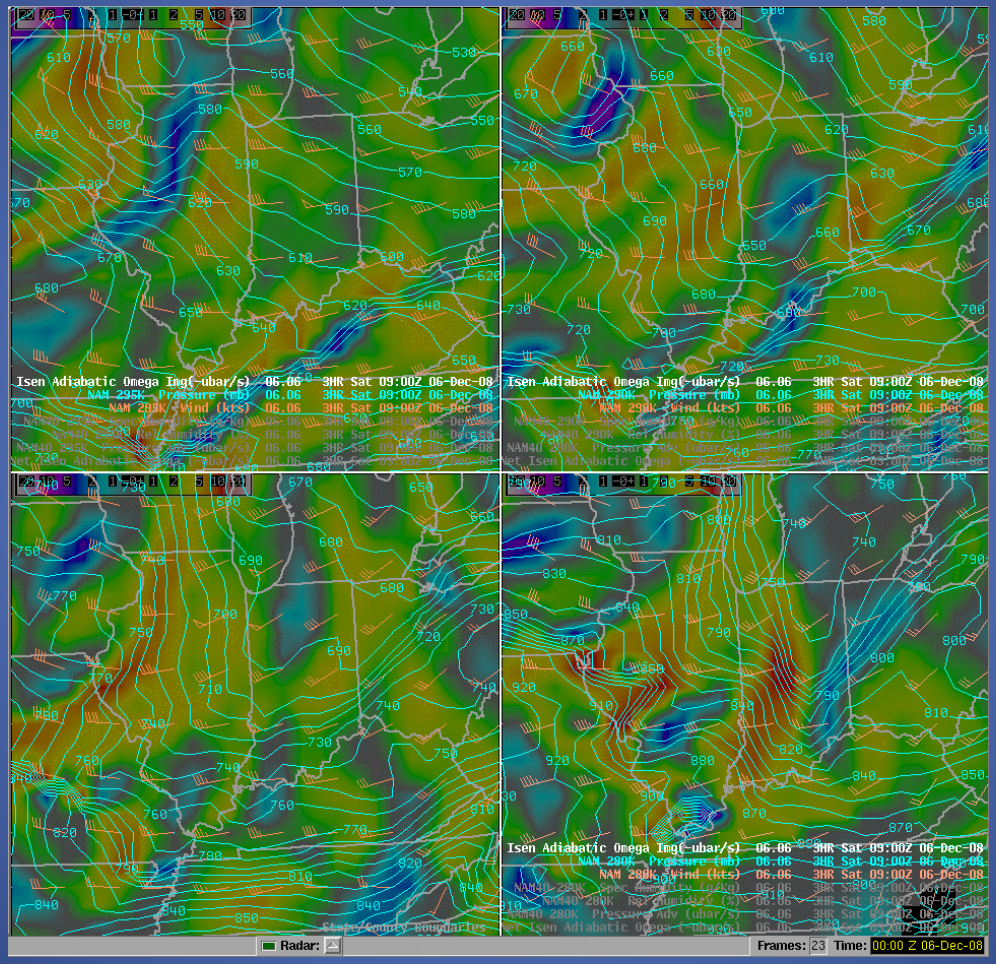


Nam precip fcst valid 12z



NAM DID SHOW IFR VIS CONDS WITHIN PRECIP WHERE IT DID DEVELOP. Nothing over our CWA.

FORCING FOR LIFT



YELLOW AND ORANGE INDICATE NET UPWARD MOTION DUE TO ISENTROPIC LIFT. THE DEEPER ORANGE INDICATES OMEGA OF 5-10 MICROBARS/SEC UP! THIS IS VALID AT 9Z.

6Z TAF FCST

KIND 060520Z 0606/0712 19008KT P6SM OVC130

FM061200 20013G23KT 3SM -SN BR SCT010 OVC020

FM061800 25017G27KT 5SM -SN BR OVC015

FM062100 27014G24KT P6SM BKN020

KLAF 060520Z 0606/0706 21006KT P6SM BKN070 OVC250
FM061000 22012G23KT 5SM -SN BR OVC025
FM061300 23013G26KT 2SM -SN BR OVC012
FM061600 25014G25KT 5SM -SN BR OVC015
FM061900 27014G24KT P6SM BKN020 AMD LTD TO CLD VIS AND WIND TIL 061400=

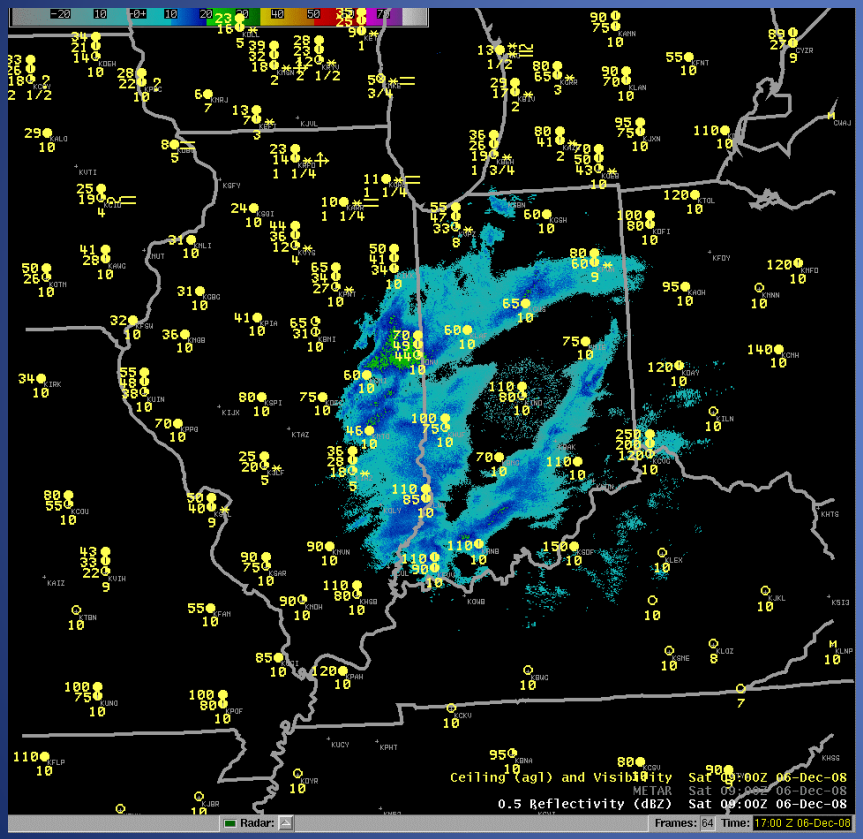
KHUF 060520Z 0606/0706 18009KT P6SM BKN070 OVC250
FM061100 20013G23KT 3SM -SN BR SCT010 OVC020
FM061800 25015G26KT 6SM -SN OVC015
FM062000 27013G23KT P6SM BKN020

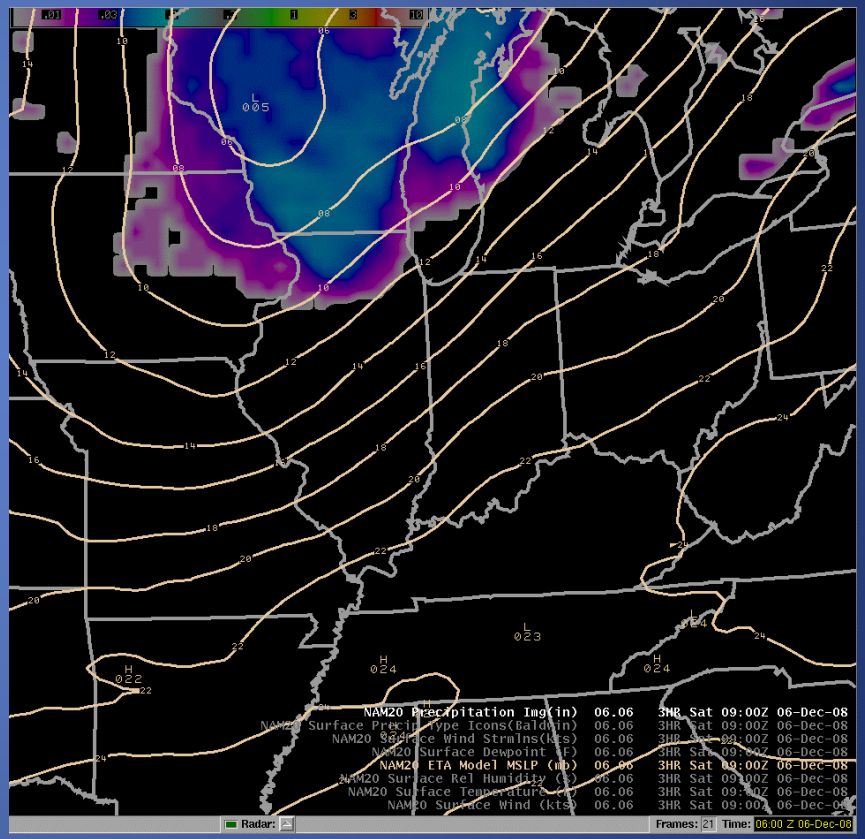
KBMG 060520Z 0606/0706 18005KT P6SM SCT070 BKN250
FM061300 21012G21KT 3SM -SN BR SCT010 OVC020
FM061900 25013G24KT 6SM -SN OVC015
FM062000 27013G23KT P6SM BKN020
AMD LTD TO CLD VIS AND WIND TIL 061400=

We did fcst ifr vis conds in the snow at LAF by 13z. The GFS also fcst cat 4 vis (2-3 mi) at LAF by 15z as it did at IND.

WHAT HAPPENED?

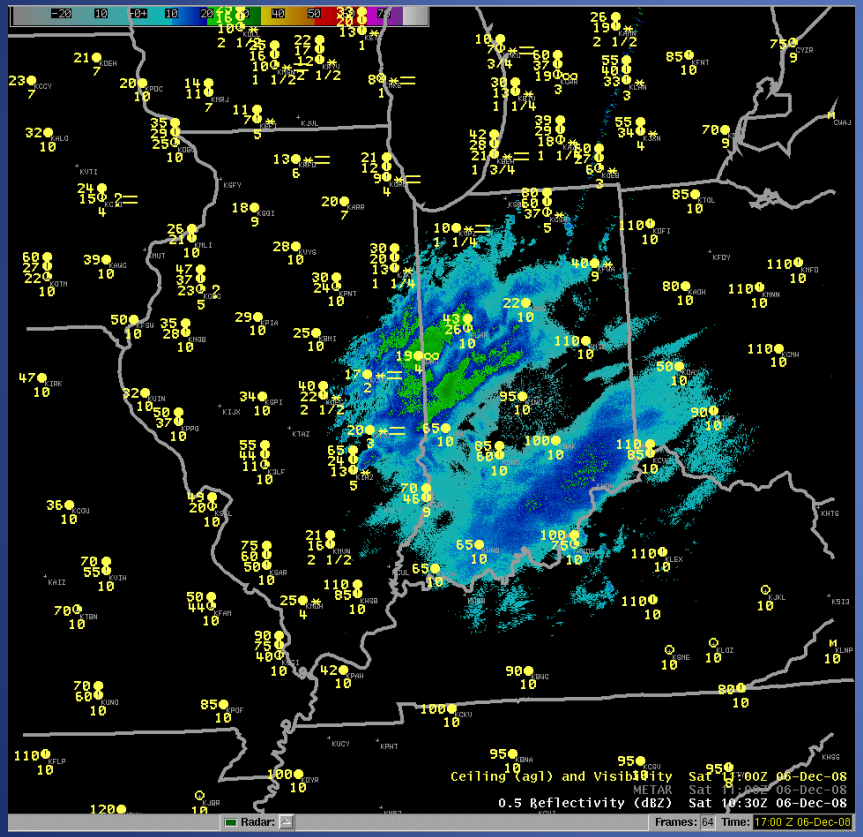
Guidance VS reality 9Z

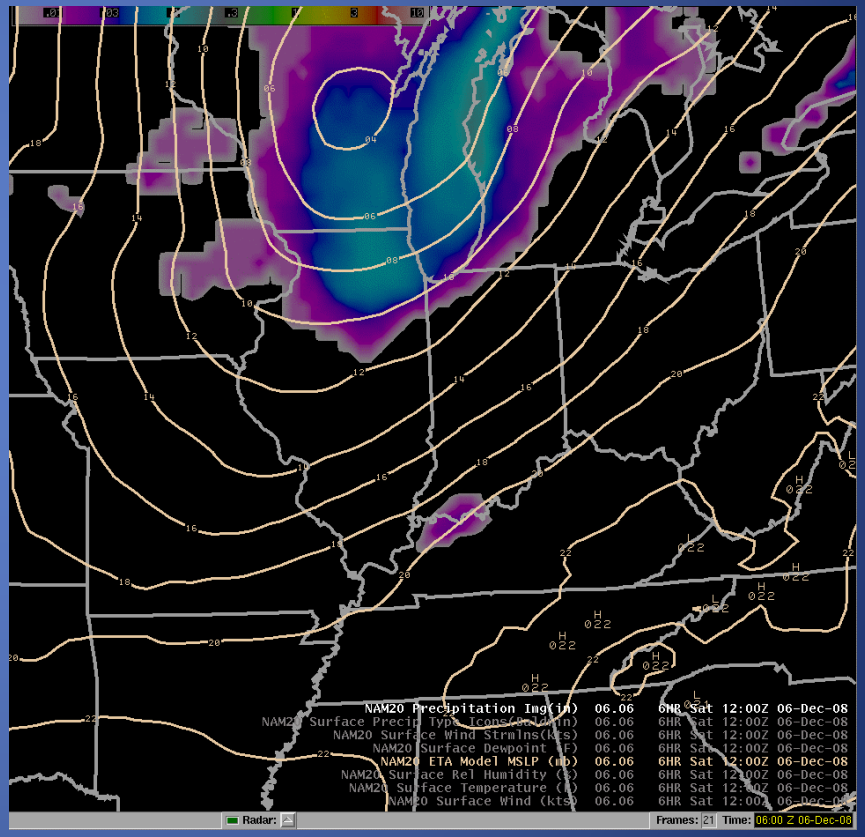




To the left we see the actual obs and radar pic from 9z. Light snow is already developing across central IL with some banded nature of the radar returns noted. Compare reality to the 3 hr nam fcst for precip valid at 9z. The NAM is too dry at this point…beware! However obs still show that vis conds were mvfr or better across all but northern IL.

Guidance VS reality 12z





By 11z…strong forcing from isentropic lift is producing lift and precip development. Vis conds are already falling into the ifr range across central IL…while the NAM DID NOT EVEN SHOW ANY PRECIP 1 HR LATER! PLEASE NOTE THAT GREEN RETURNS (25-30DBZ) can be associated with ½ to 1 inch/hr snows (see winter weather binder) In this case the atmosphere was still trying to saturate but once it did we see vis fall into the ifr range.

12Z TAFS

KIND 061129Z 0612/0718 19014G20KT 6SM -SN BR BKN050
FM061300 22016G24KT 2SM -SN BR OVC015
FM061600 23016G24KT 6SM -SN BR BKN025
FM062100 28017G25KT P6SM BKN025
FM070100 30015KT P6SM BKN025
FM070900 31012KT P6SM BKN050=

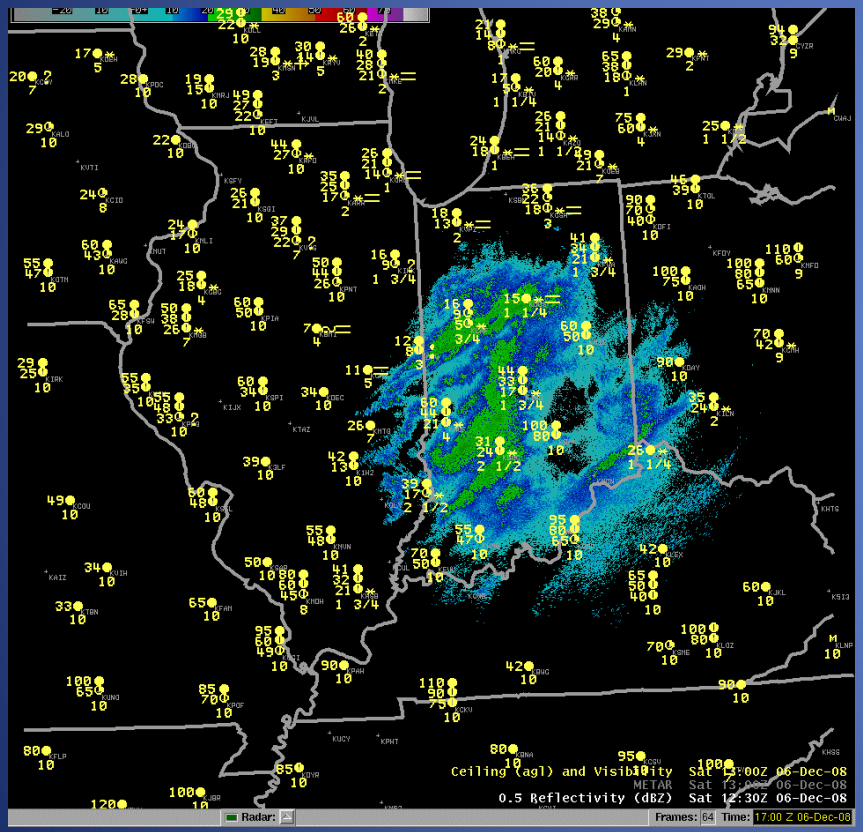
KLAF 061129Z 0612/0712 21012G20KT 2SM -SN OVC014
FM061500 23015G22KT 6SM -SN BR OVC025
FM062100 29014G24KT P6SM BKN020
FM070200 30014KT P6SM BKN020
FM071000 31006KT P6SM BKN050
AMD LTD TO CLD VIS AND WIND TIL 061400=

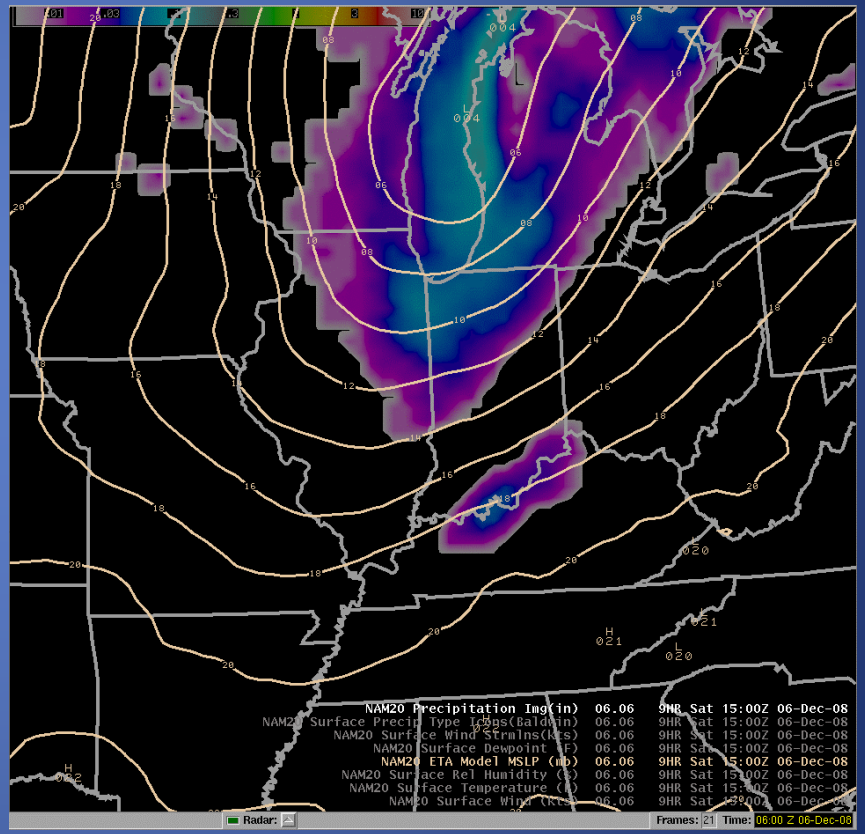
KHUF 061129Z 0612/0712 19011KT 2SM -SN BKN017
FM061500 23015G24KT 6SM -SN OVC015
FM062000 28016G25KT P6SM BKN025
FM070100 30015KT P6SM BKN025
FM071000 31006KT P6SM BKN050=

KBMG 061129Z 0612/0712 19008KT P6SM BKN060 OVC090
FM061400 21012G21KT 3SM -SN BR SCT010 OVC020
FM061900 25013G24KT 6SM -SN OVC015
FM062000 27013G23KT P6SM BKN025
FM070100 30012KT P6SM BKN025
FM071000 31005KT P6SM BKN050
AMD LTD TO CLD VIS AND WIND TIL 061400=

Based off of radar and ob reports we fcst prevailing IFR vis conds at all but BMG in the 12z TAFS. What actually happened?

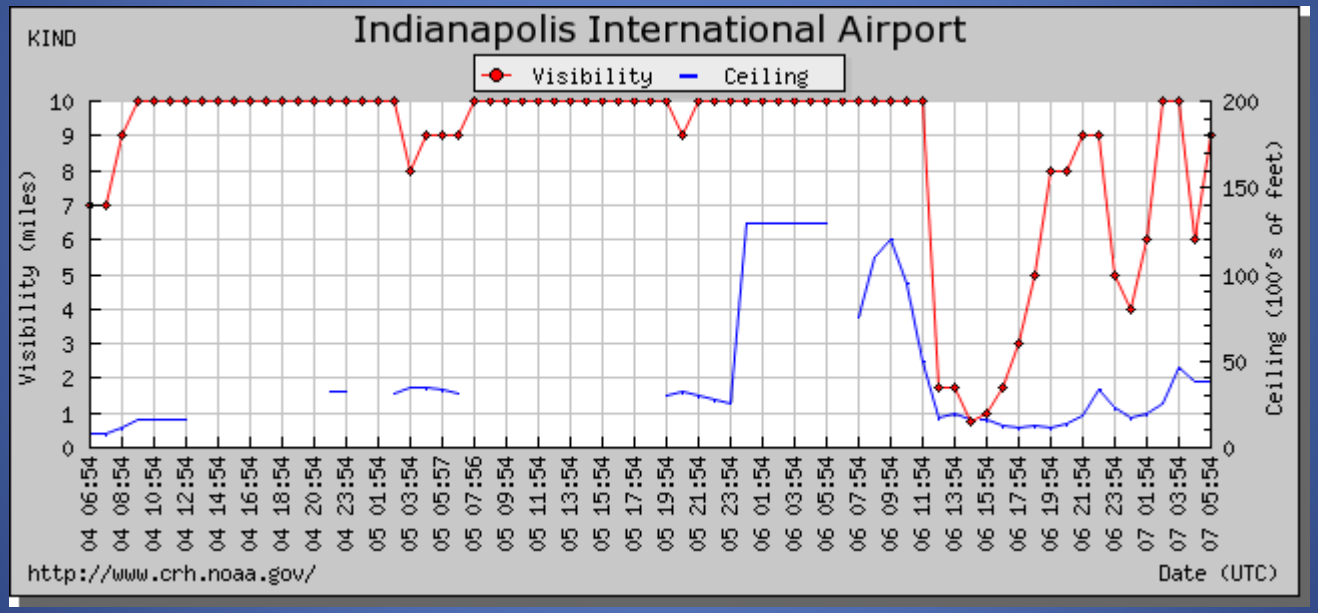
Guidance VS reality 13z





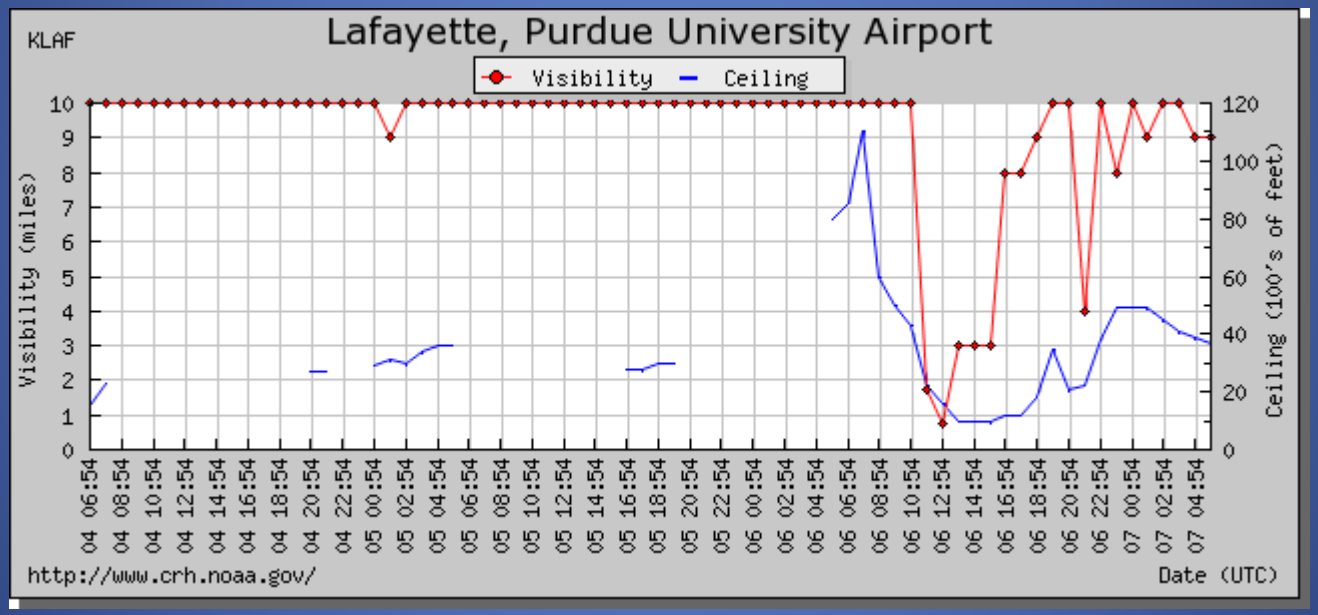
By the next taf fcst issuance it is obvious that the nam is too slow/dry with the precip event. Radar returns and obs show ifr conds developing rapidly across the CWA. What did we fcst in the 12z TAFS?

WHAT HAPPENED AT IND?



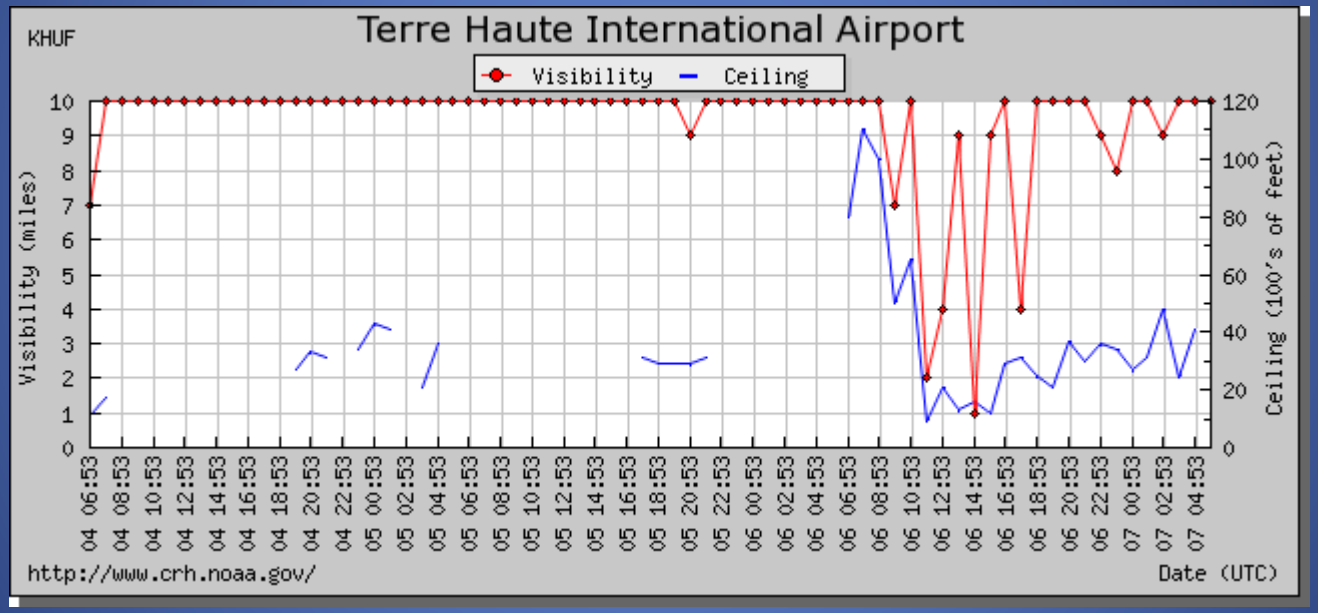
IFR CONDS DEVELOPED QUICKLY AT IND AROUND 12Z with vis conds going from 10sm to less than 2 in snow! Also, note that cigs dropped into the IFR range and did not improve until 22z. Bufkit captured this but mos products did not.

LAF



Similar conds at laf

HUF


KHUF
Terre Haute International Airport
Visibility
Ceiling
Visibility (miles)
Ceiling (100's of feet)
0 1 2 3 4 5 6 7 8 9 10
0 20 40 60 80 100 120
04 06:53
04 08:53
04 10:53
04 12:53
04 14:53
04 16:53
04 18:53
04 20:53
04 22:53
05 00:53
05 02:53
05 04:53
05 06:53
05 08:53
05 10:53
05 12:53
05 14:53
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06 16:53
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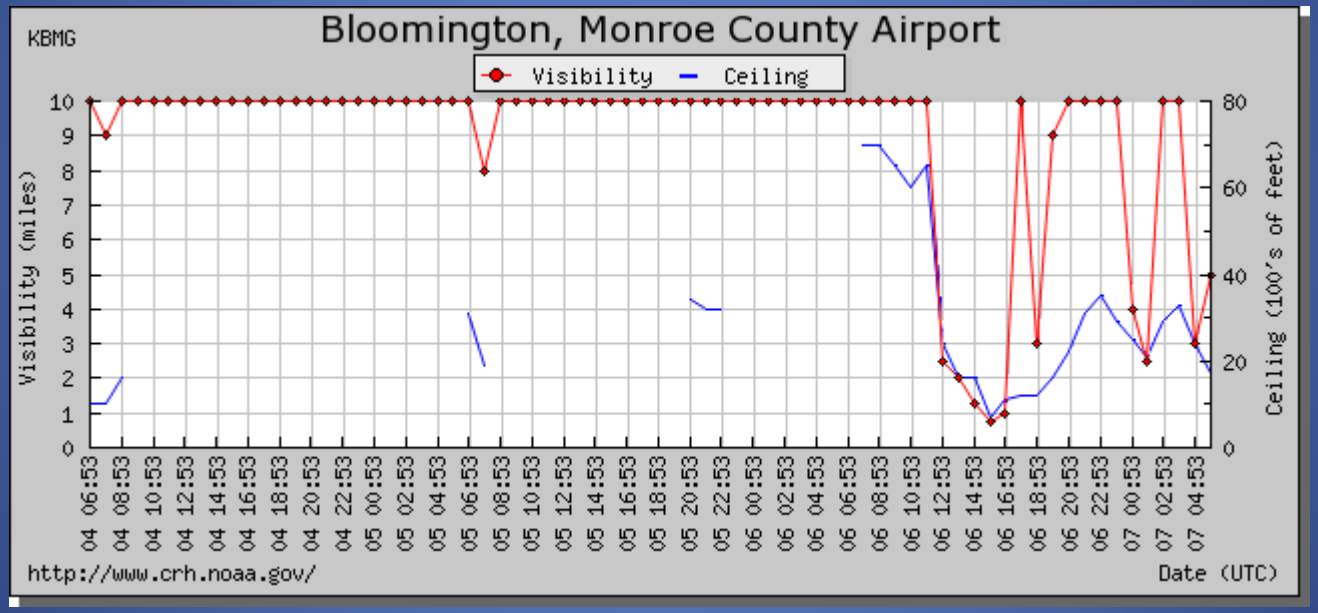
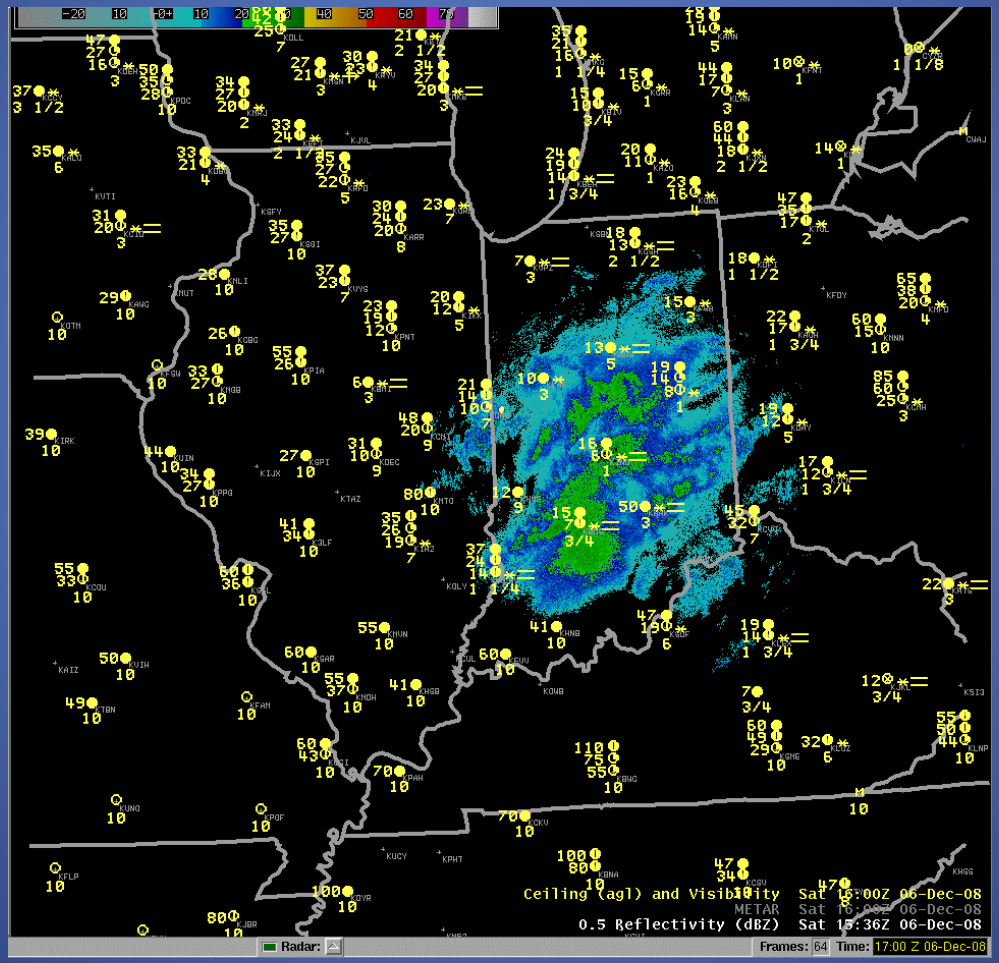
http://www.crh.noaa.gov/
Date (UTC)

BMG


KBMG
Bloomington, Monroe County Airport
Visibility
Ceiling
Visibility (miles)
Ceiling (100's of feet)
http://www.crh.noaa.gov/
Date (UTC)

16z final slide



Widespread 20-30dbz returns across the CWA with IFR VIS CONDS.

CONCLUSION

- ISENTROPIC LIFT AHEAD OF A CLIPPER SYSTEM BROUGHT 1-2 INCHES OF SNOW AND IFR CONDS TO ALL SITES
- DIFFICULT TO FCST SINCE CONDS ARE ASSOCIATED WITH PRECIP INTENSITY THAT IS UNKNOWN BEFORE PRECIP DEVELOPS
- GFS MOS DID SHOW A BRIEF PERIOD OF 2-3SM CONDS AT IND AT 15Z ETA MOS DID NOT
- NAM BUFKIT DATA DID FCST IFR VIS CONDS AT IND DEVELOPING BETWEEN 12Z AND 15Z (OVERVIEW SECTION OF BUFKIT)
- USING RADAR TRENDS AND OBS IS CRITICAL TO PROVIDING A SHORT TERM FCST THAT IS SUPERIOR TO MODEL GUIDANCE.
- THIS CASE SUPPORTS THE IDEA OF USING BUFKIT SOUNDING DATA AND OVERVIEW AVIATION DATA TO ASSIST IN MAKING MORE ACCURATE TAF FCSTS AND UPDATES.