The Evolution of NWS Digital Aviation Services (DAS):
Developing a Unified Forecast Process

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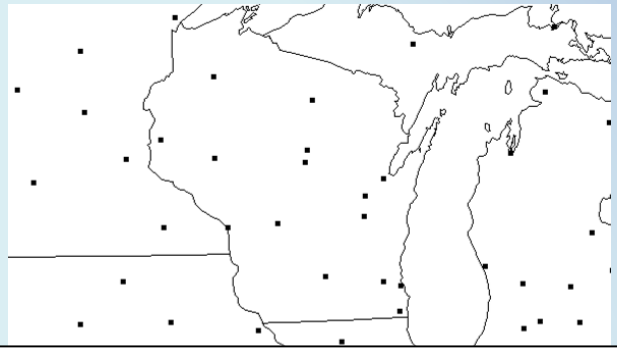
Brian Hirsch, RAM, NWS Central Region

GLOM Conference May 1-3, 2018

Wide Range of Users



NWS TAFs: 665

U.S. Airfields: 19,164

= **3.5%**

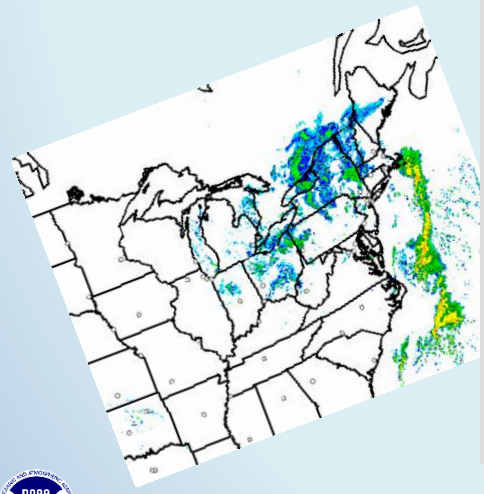
Visibility and Cloud Height Forecast Coverage

```
TAFORD
TAF AMD
KORD 101358Z 1014/1118 26015G24KT P6SM FEW050 SCT100
     FM102100 06008KT P6SM VCTS BKN045CB BKN100
      TEMPO 1021/1024 2SM TSRA BKN030CB
     FM110000 07005KT P6SM SCT080 BKN250
     FM111200 06007KT 6SM BR BKN010
     FM111500 06009KT P6SM SCT015 BKN035=
```

Aviation Forecast Tool: Models

HRRR Model

- visibility
- total cloud cover
- low-level cloud cover
- mid-level cloud cover
- high-level cloud cover
- cloud top height
- ceiling



U.S. Department of Commerc

NOAA Earth Sys
High Reso

Earth Modeling Branch (EI

HRRR Home Info Page

Current and Forecast Graphics

Operational NCEP HRRR:

NCEP HRRR CONUS Hourly

NCEP HRRR CONUS Subhourly

Experimental HRRR Products:

Deterministic

HRRR CONUS Hourly

HRRR CONUS Subhourly

HRRR CONUS Smoke

HRRR Alaska

HRRR Alaska Smoke

HRRR Hawaii

HRRR Caribbean

HRRR PacNW 750m Nest

HRRR Soundings

HRRR Reflectivity Matrix

HRRR Aviation Fields Hourly

HRRR Aviation Fields Sub-hrly

LAMP (Localized Aviation MOS Program)

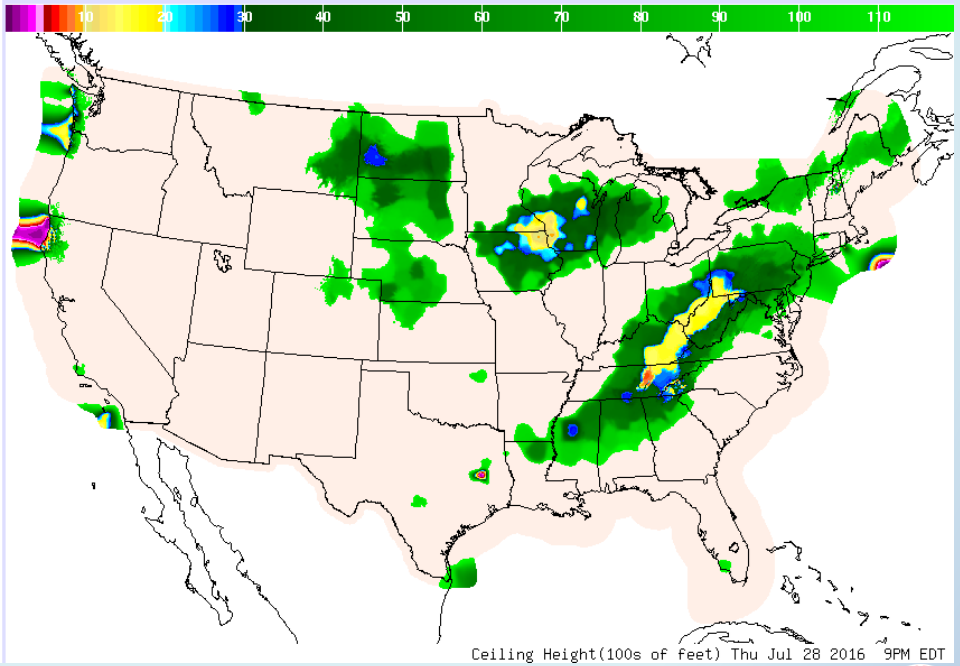
Graphics
- Analysis Images
- Meteograms
- Probability Plots
- Station Plots
- Convection
- LTG & CONV
- Gridded LAMP

Temp/DewPt Obs	Ceiling Hgt Obs	Visibility Obs	Sky Obs	Wind Obs	Wind Gust Obs	Temp/DewPt Fcsts	Ceiling Hgt Fcsts	Visibili Fcsts
✓	✓	✓	✓	✓	✓	✓	✓	✓

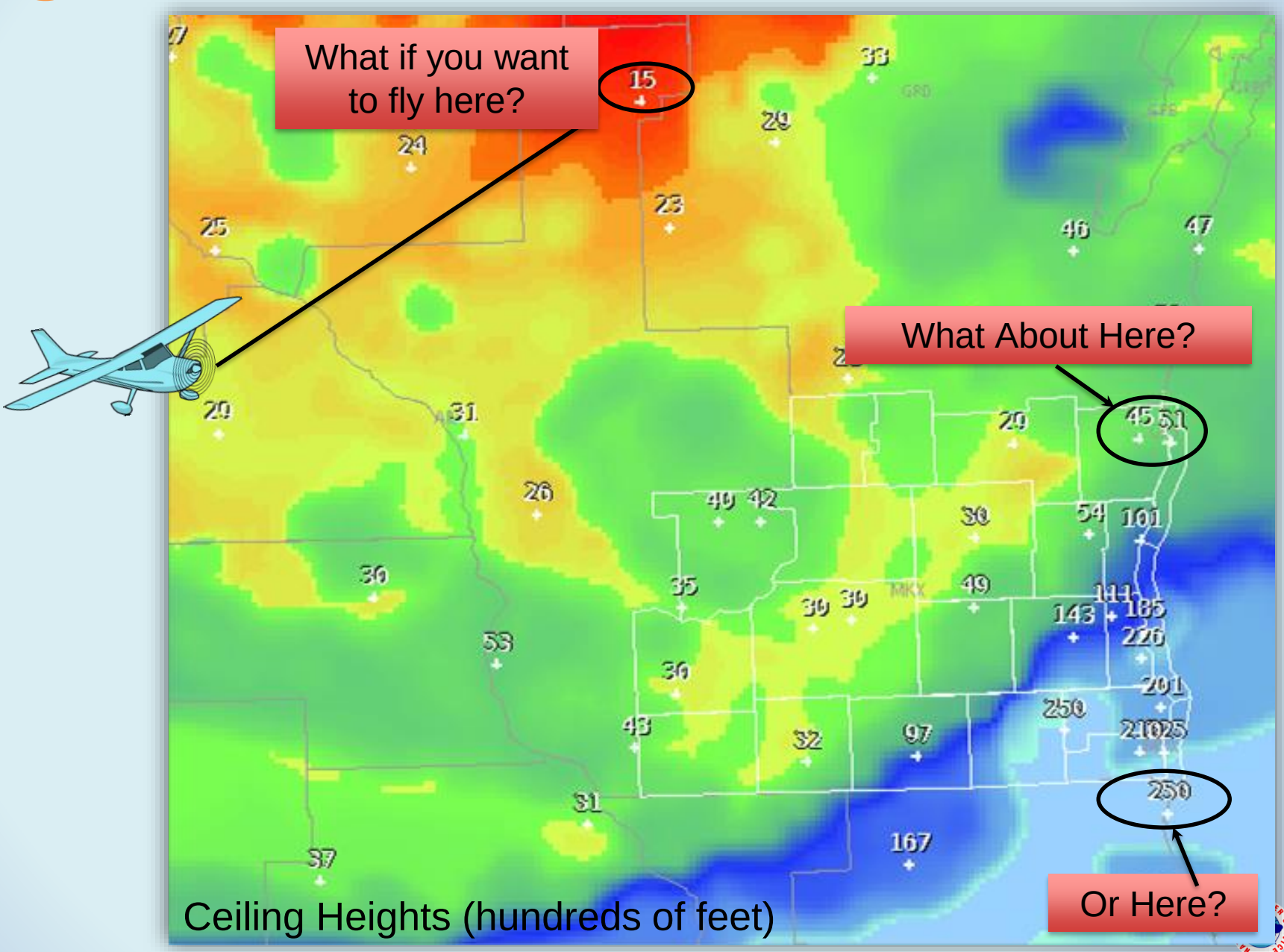
A check mark indicates that element has been updated for following cycle:

Download GRIB2 data from the ftp or http sites.(Links to be activ

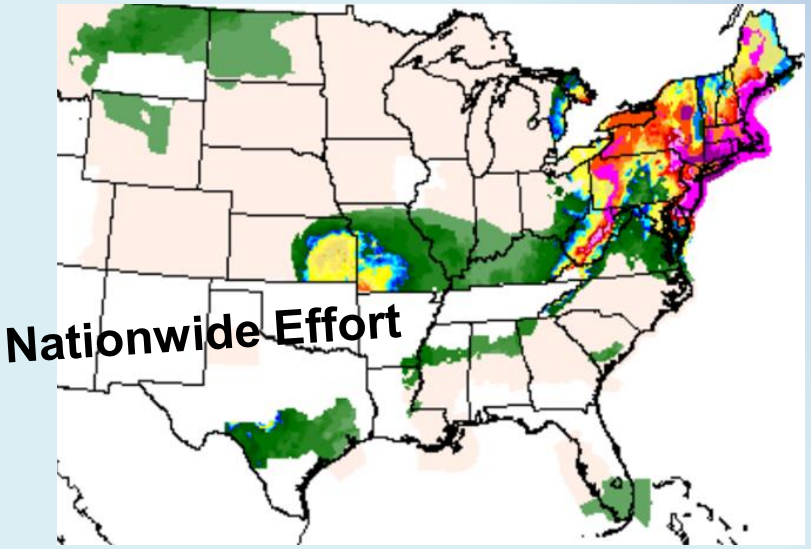
Gridded LAMP Products: Ceiling Height | 1800 UTC | 07 proj | Looping Control | Loop



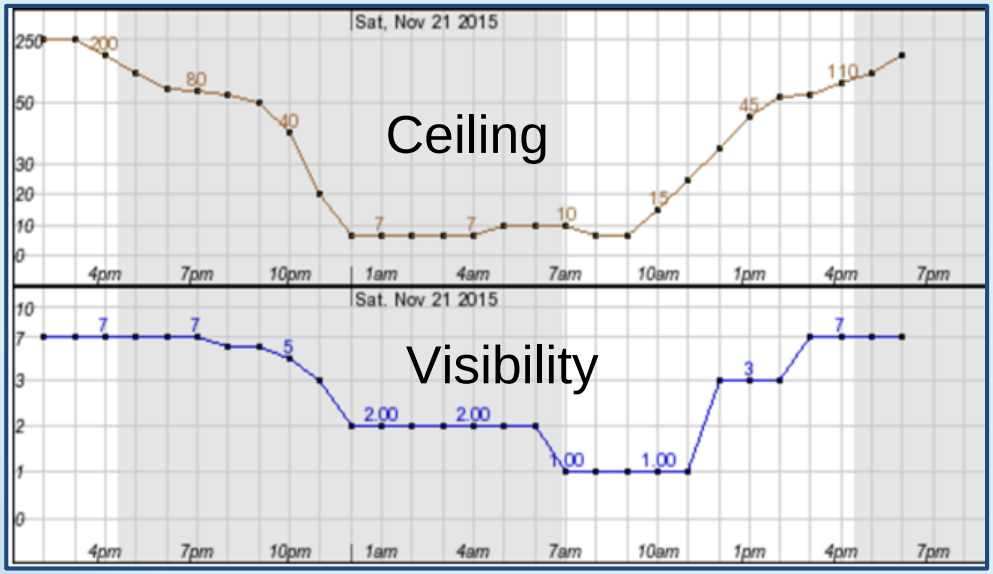
Digital Aviation Services

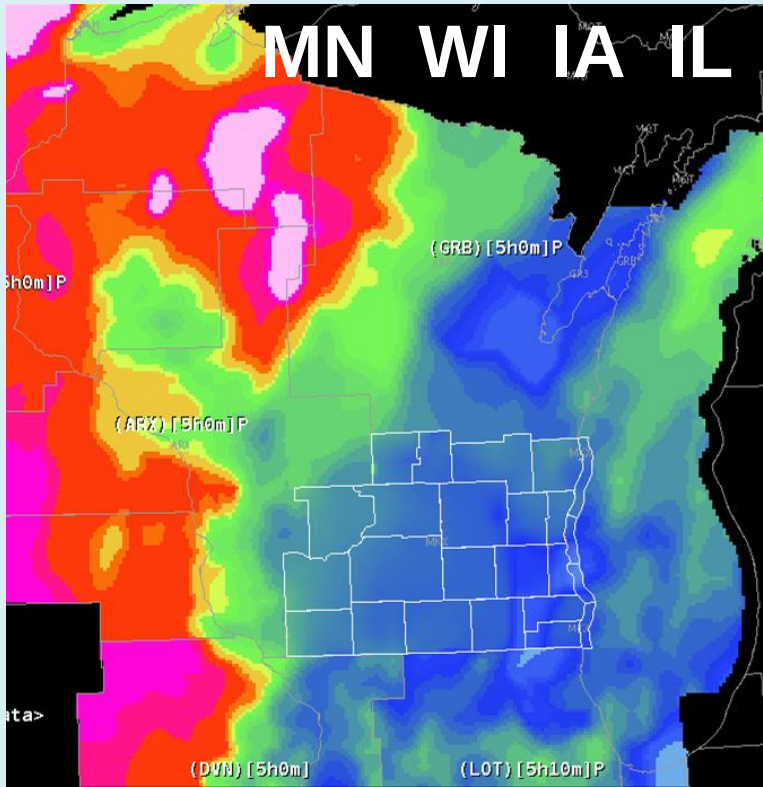


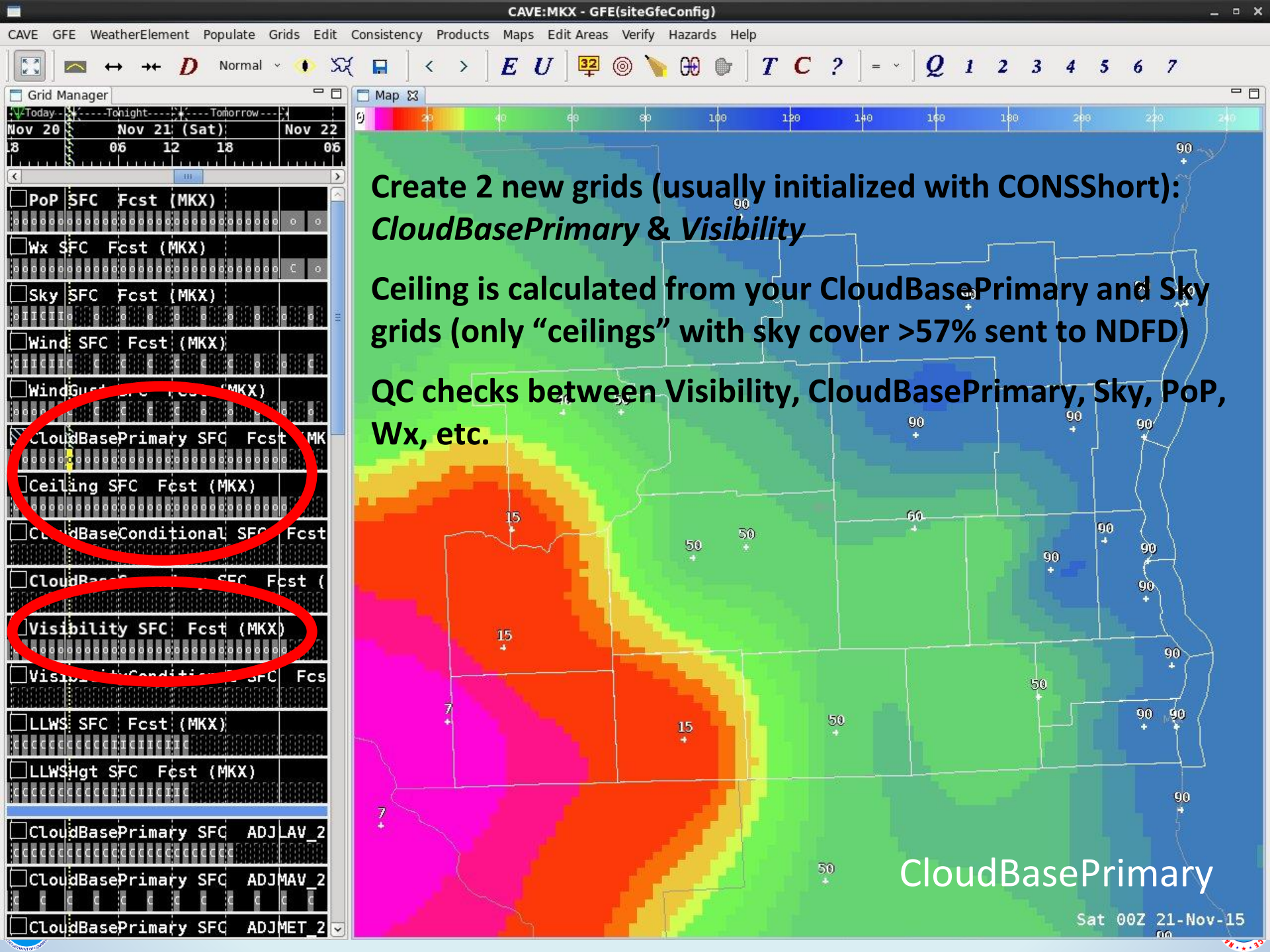
Consistency…

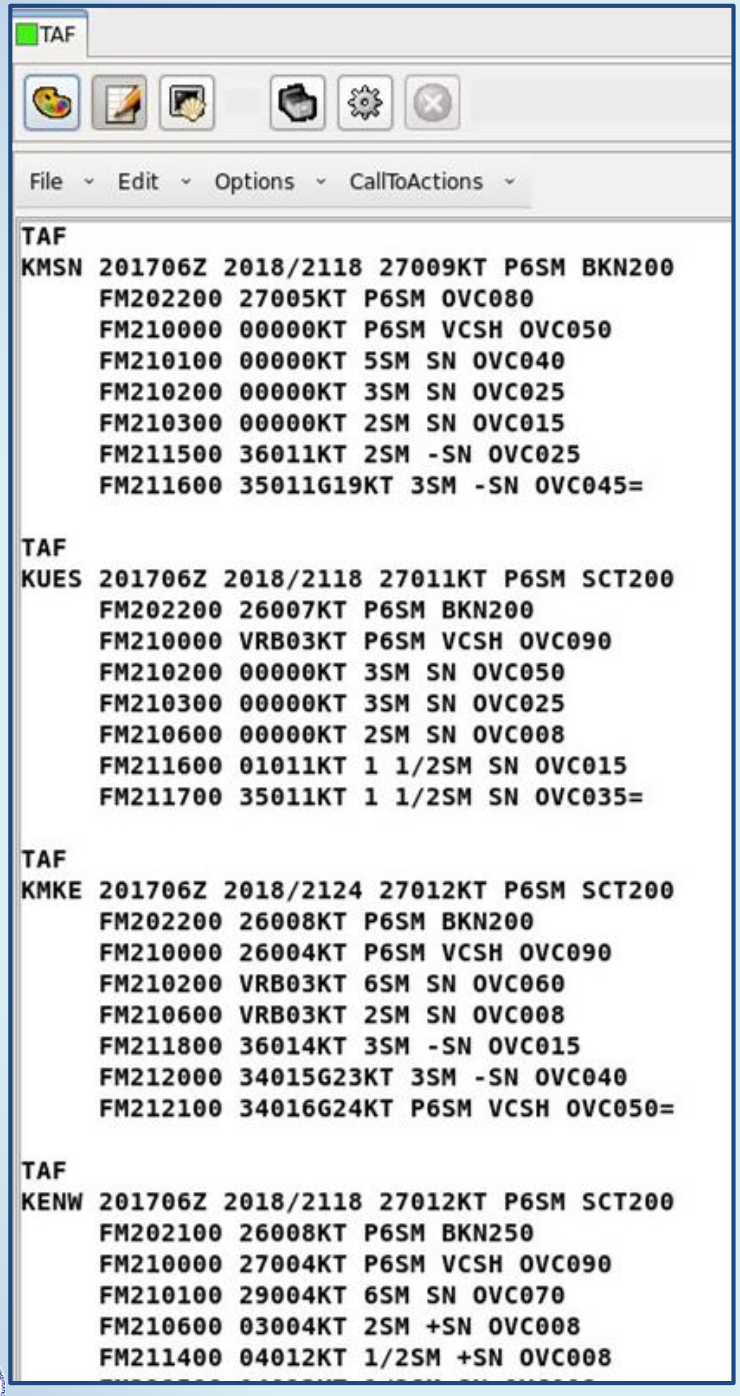


- Between TAFs, other products
- Between offices






CAVE:MKX - GFE(siteGfeConfig)
CAVE GFE WeatherElement Populate Grids Edit Consistency Products Maps Edit Areas Verify Hazards Help
Grid Manager
Map
Today Tonight Tomorrow
Nov 20 Nov 21 (Sat) Nov 22
PoP SFC Fcst (MKX)
Wx SFC Fcst (MKX)
Sky SFC Fcst (MKX)
Wind SFC Fcst (MKX)
CloudBasePrimary SFC Fcst MK
Ceiling SFC Fcst (MKX)
Visibility SFC Fcst (MKX)
LLWS SFC Fcst (MKX)
LLWSHgt SFC Fcst (MKX)
CloudBasePrimary SFC ADJLAV_2
CloudBasePrimary SFC ADJMAV_2
CloudBasePrimary SFC ADJMET_2
Create 2 new grids (usually initialized with CONSShort): CloudBasePrimary & Visibility
Ceiling is calculated from your CloudBasePrimary and Sky grids (only “ceilings” with sky cover >57% sent to NDFD)
QC checks between Visibility, CloudBasePrimary, Sky, PoP, Wx, etc.
CloudBasePrimary
Sat 00Z 21-Nov-15



TAFs Consistent With Your Grids

Grids used for TAF Formatter

Edit using AvnFPS

Send TAFs

DAS History & Acknowledgements

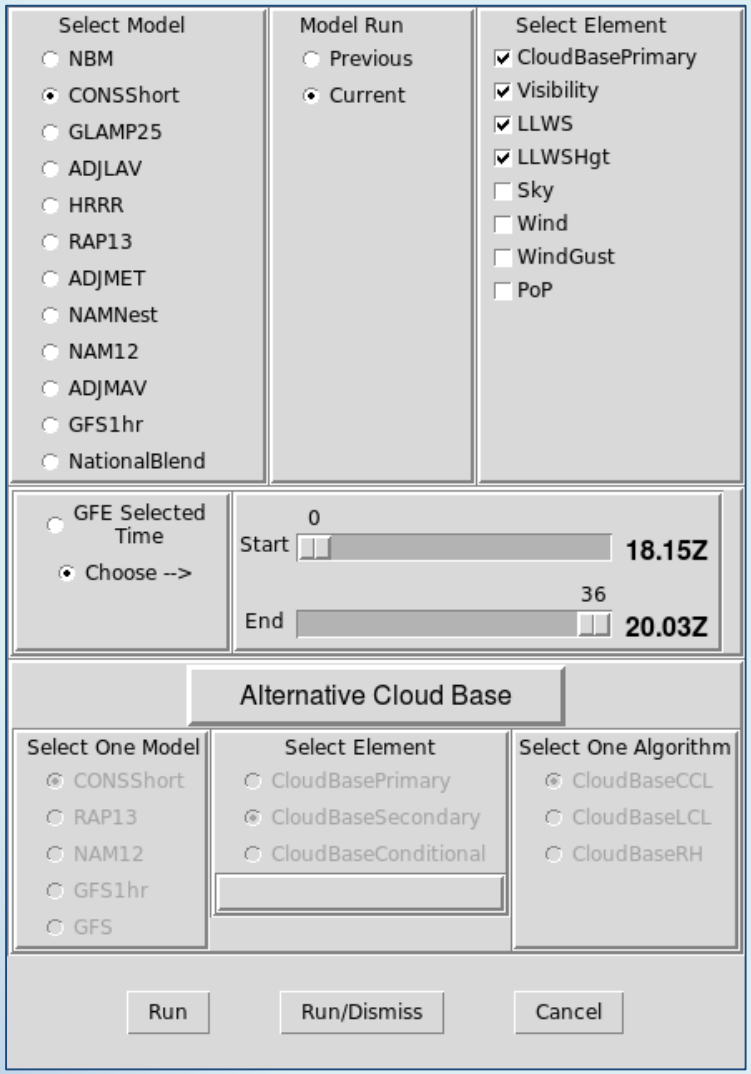
- ✓ Many offices already implemented and adapted with modifications
  - JKL (Jackson, KY)
  - RLX (Charleston, WV) — Smart Tools
  - BOX (Boston, MA) — Procedures
  - GSP (Greenville–Spartanburg, SC)
  - CAR (Caribou, MA)
  - MQT (Marquette, MI)
  - MKX (Milwaukee–Sullivan, WI)
  - Many others operational

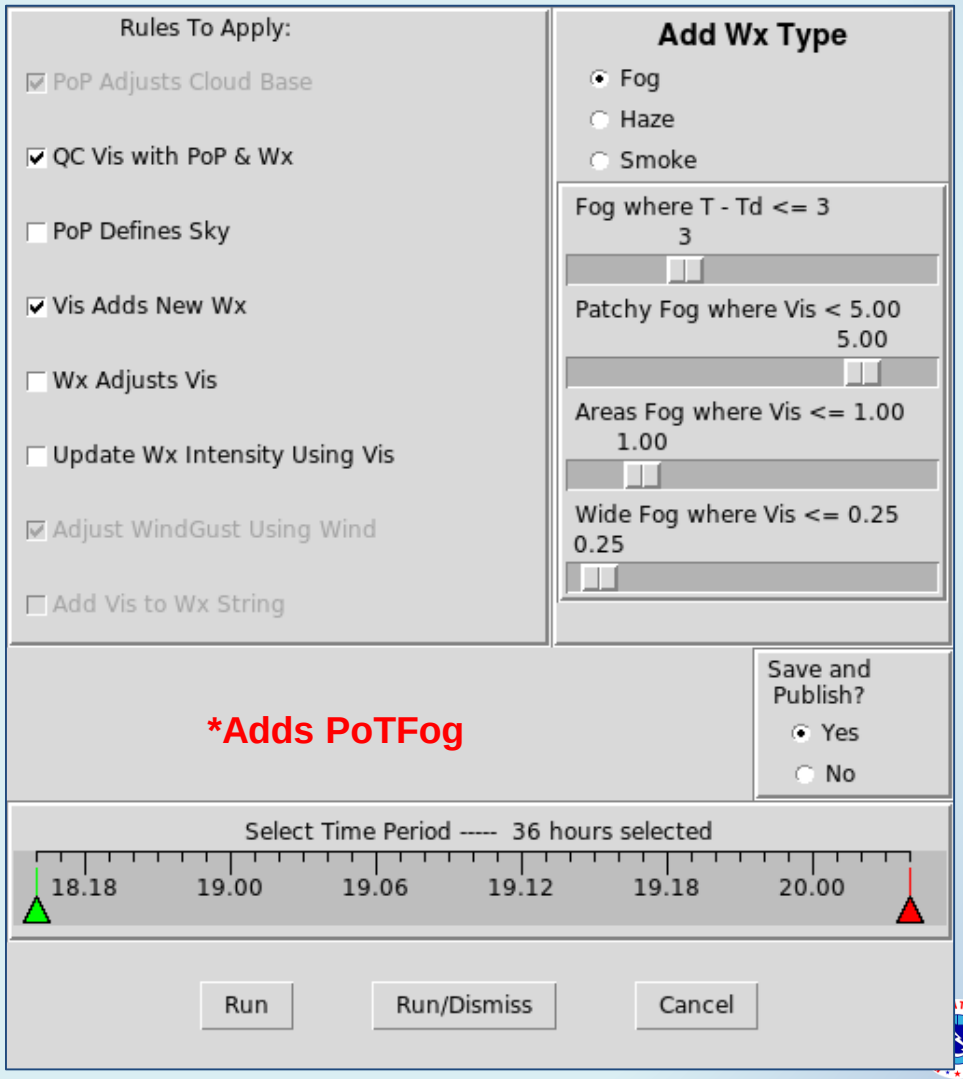
Many of the verification tools, as well as MatchObsAll (verifying Observation) and MatchGuidanceAll (ADJXXX models), were originally designed by Tim Barker SOO-BOI

- ✓ Global Systems Division (Boulder, CO) Development
  - Developed national TAF formatter and tools
  - Involved in national–level DAS development team (along with many Aviation Focal Points, SOOs and ITOs)

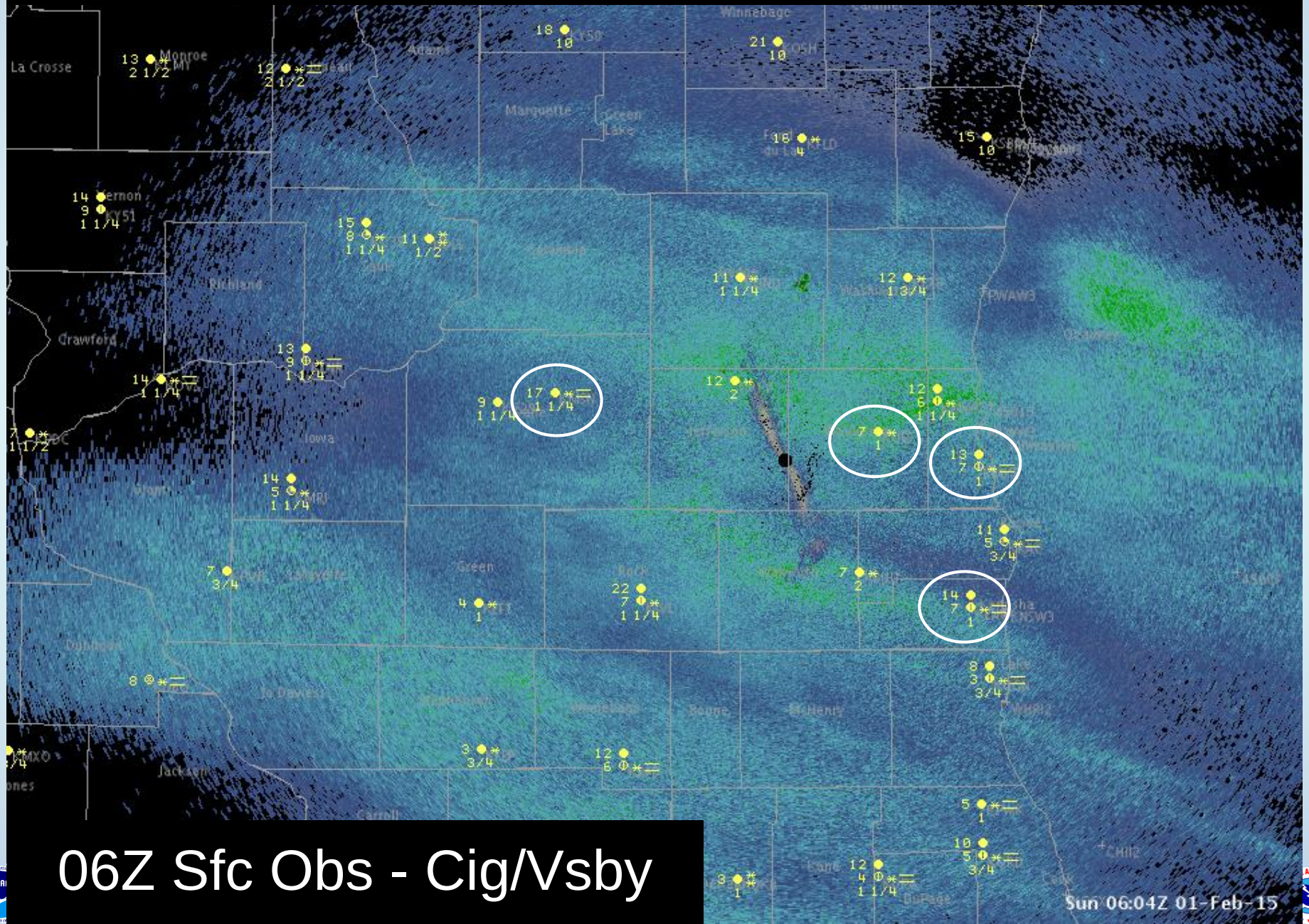
U.S. Department of Commerce | National Oceanic & Atmospheric Administration
Earth System Research Laboratory
Global Systems Division

Aviation_Populate
Aviation_Finalize



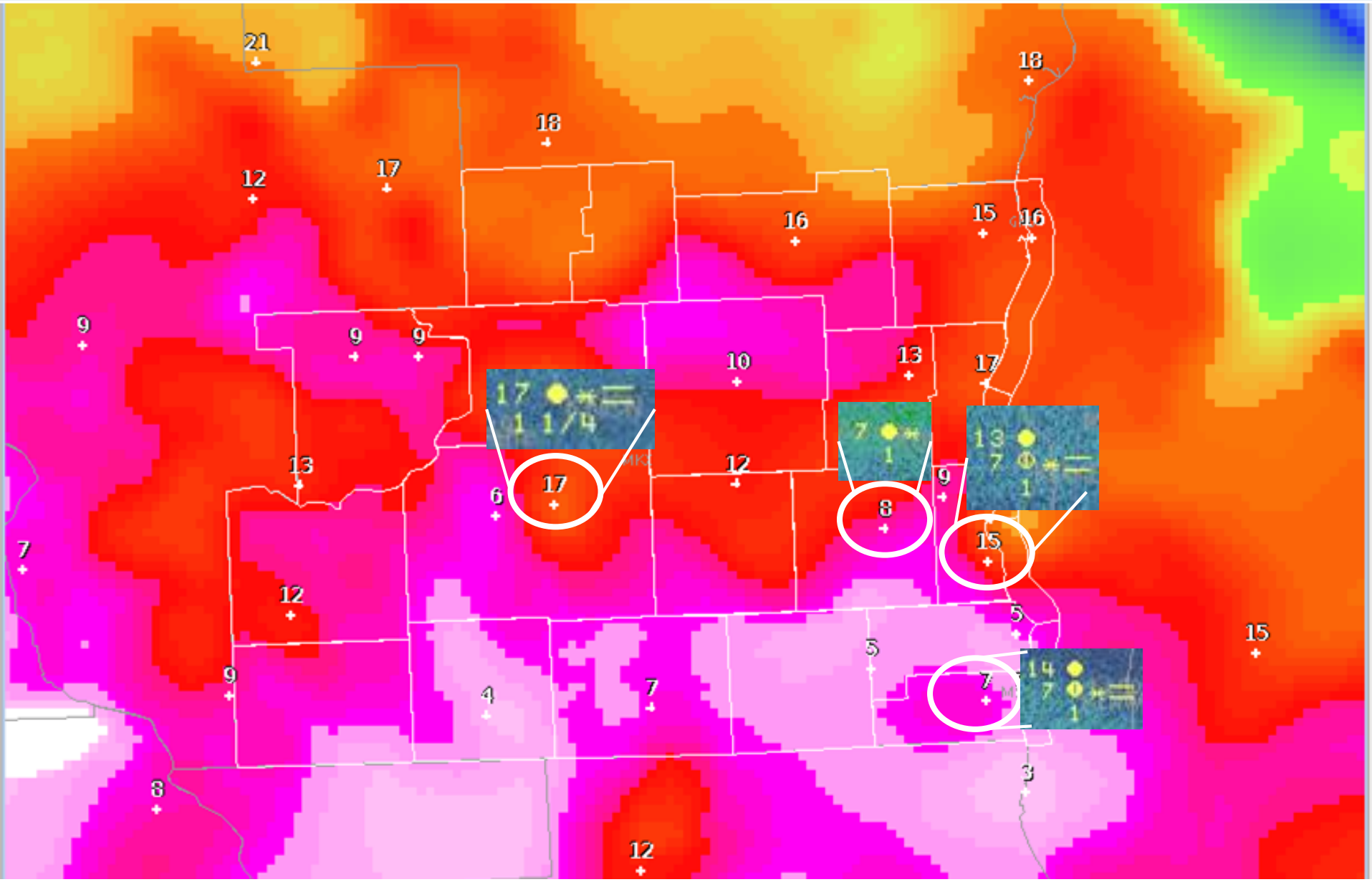


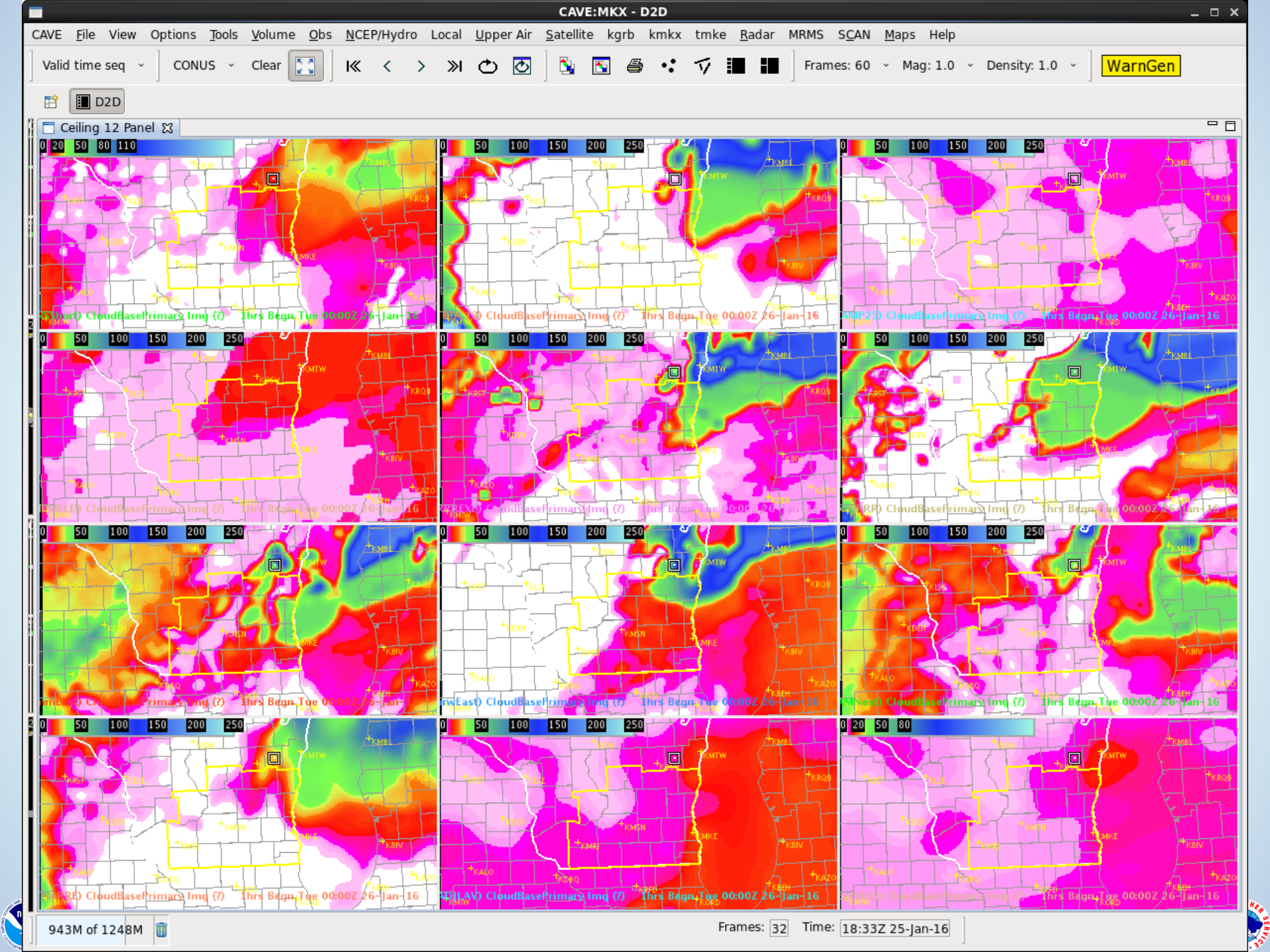
Aviation Forecast Tool: Observations

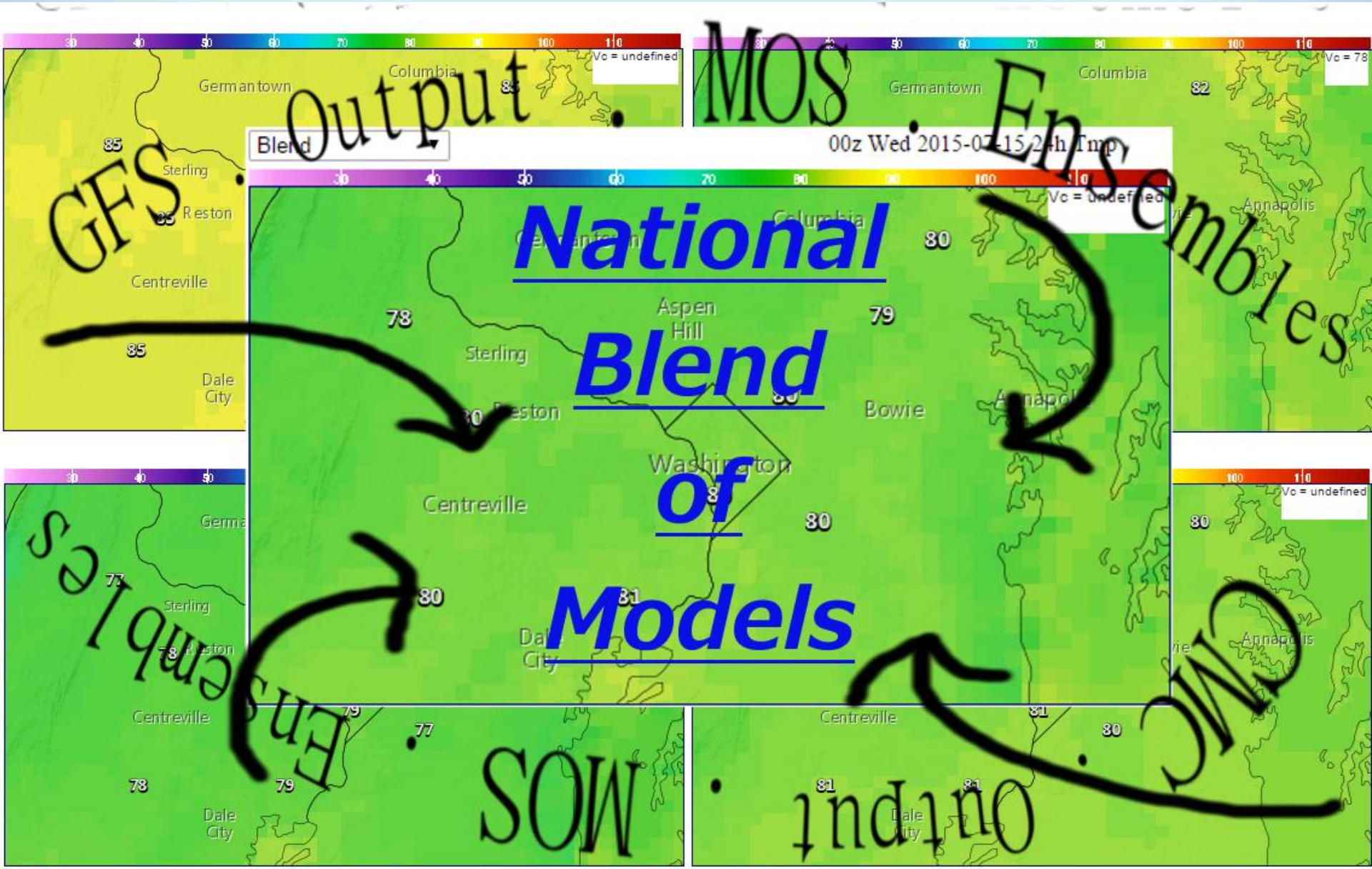


06Z Sfc Obs - Cig/Vsby

Obs Grid – CloudBasePrimary




CAVE:MKX - D2D
CAVE File View Options Tools Volume Obs NCEP/Hydro Local Upper Air Satellite kgrb kmkx tmke Radar MRMS SCAN Maps Help
Valid time seq
CONUS
Clear
Frames: 60
Mag: 1.0
Density: 1.0
WarnGen
D2D
Ceiling 12 Panel
943M of 1248M
Frames: 32
Time: 18:33Z 25-Jan-16


GFS Output
MOS Ensembles
National Blend of Models
Ensembles SOW
OMC Output

Aviation Grids Verify Well!

Forecasters add value to the model blends in the short term

	Heidke Comparis		
Fcst Heidke	Fcst Rank Amoung Guidance	Best Guidance	2nd Best Guidance
0.674	2 out of 19	CONSShortTL 0.680	ADJLAV 0.660
0.662	1 out of 19	ADJLAV 0.654	GLAMP25 0.653
0.646	1 out of 22	CONSShortTL 0.631	GLAMP25 0.630
0.627	1 out of 19	GLAMP25 0.613	CONSShortTL 0.609
0.624	1 out of 19	GLAMP25 0.620	ADJLAV 0.615
0.605	3 out of 21	GLAMP25 0.613	ADJLAV 0.608
0.601	2 out of 18	CONSShortTL 0.604	GLAMP25 0.601
0.606	1 out of 18	GLAMP25 0.604	ADJLAV 0.602
0.597	1 out of 21	CONSShortTL 0.593	GLAMP25 0.589
0.583	1 out of 14	CONSShortTL 0.583	GLAMP25 0.578
0.588	2 out of 14	CONSShortTL 0.595	GLAMP25 0.585
0.586	1 out of 14	CONSShortTL 0.571	CONSShortTest 0.571

Statistical Ranking for past 200 days since 4/24/18

National DAS Plan

National DAS tools developed by GSD

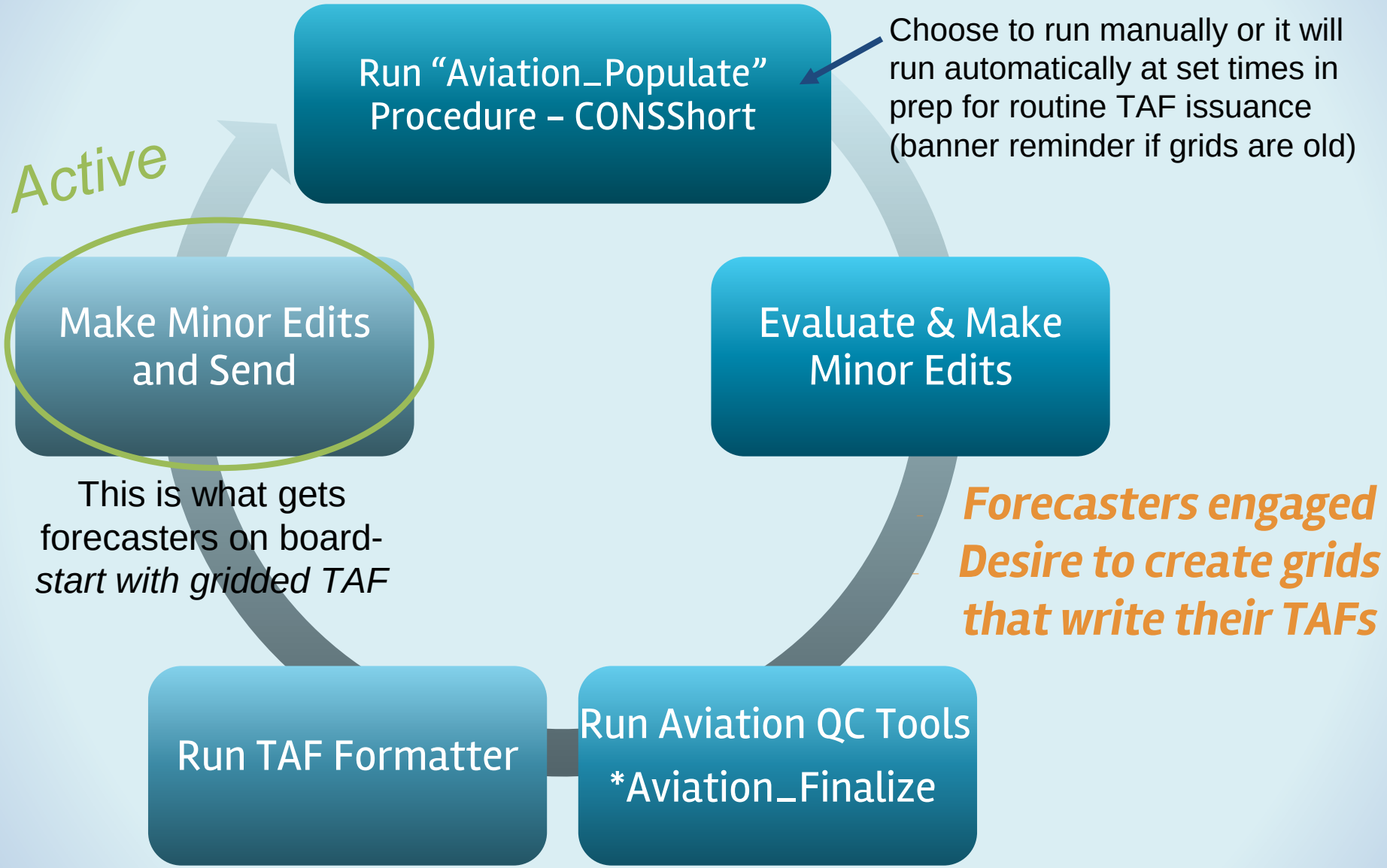
Training now available

Operational Goals:

The success criteria outlined in the national DAS Implementation Plan describes an “accurate and nationally consistent database for the NWS and aviation partners”.

Aviation Weather Center involvement

"Operational" in CR for Spring 2018



National DAS Deliverables Team

Led by Jamie Enderlen (NWS Chicago), with assistance from Brian Hirsch and also Eastern Region representatives

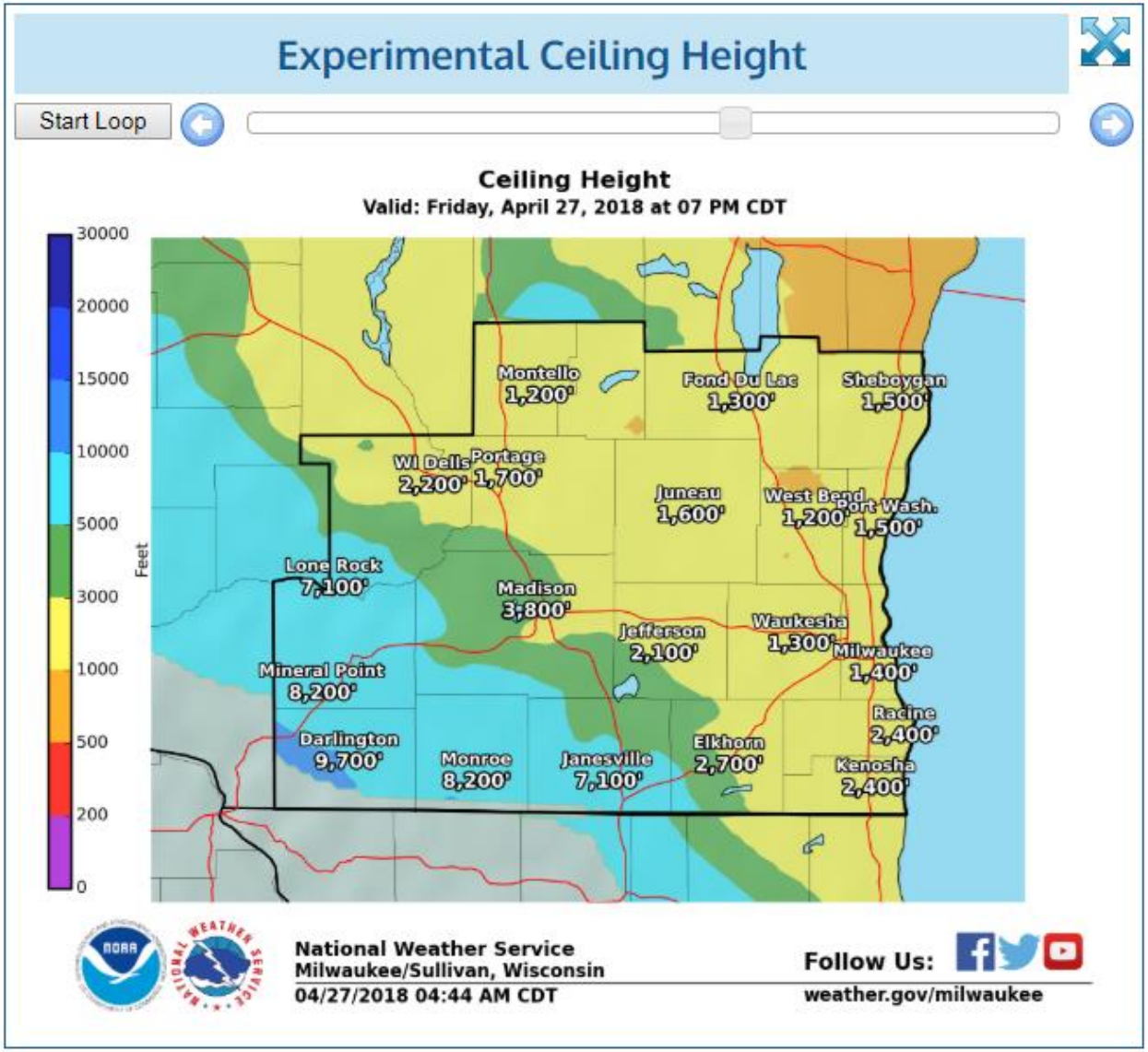
Goals

- [Short Term] DAS graphics displayable now
  - Hourly Weather Graph, SacGIM Graphics
- [Mid Term] Gather user feedback
- [Long Term, after FY2021] DAS grids displayed via NDFD and AWC with partner feedback in mind

Planned Workshops, Questions to ask partners

- Boston: June/July 2018
- Chicago: June 15-16, 2018

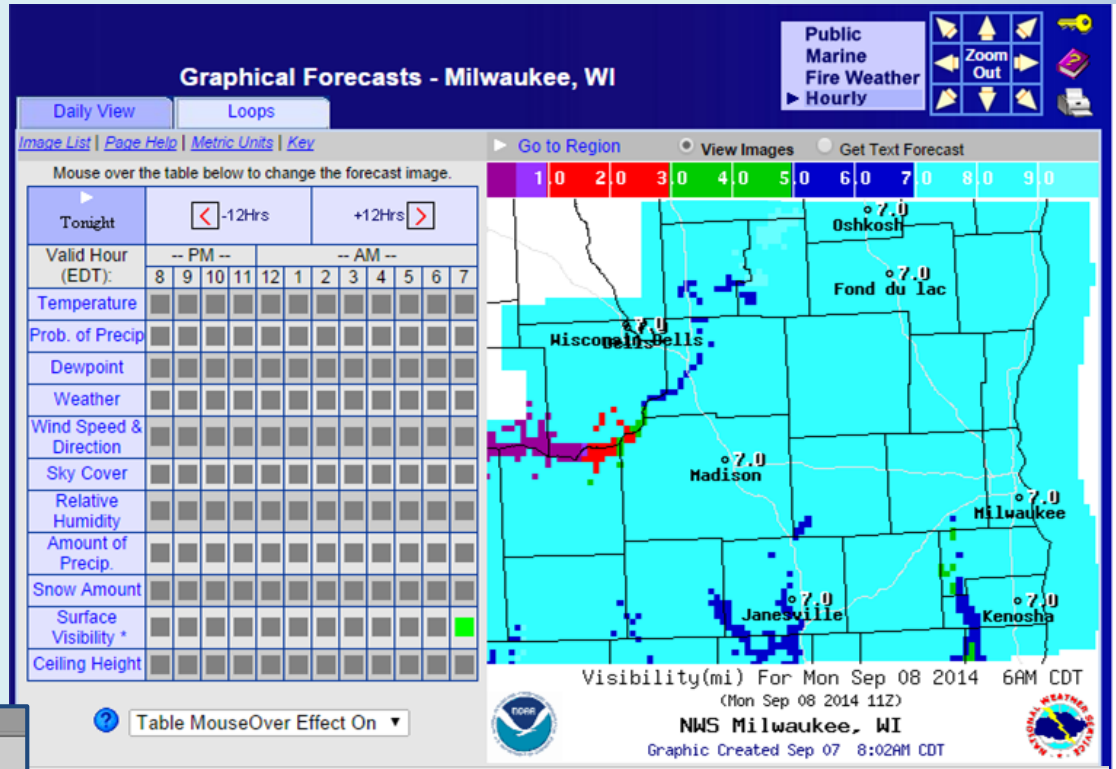
Ceiling Forecast | Visibility Forecast | Precip Chance Forecast | Wind Forecast | Sky Forecast | Exp LLWS Forecast | Exp LLWS Hgt Forecast

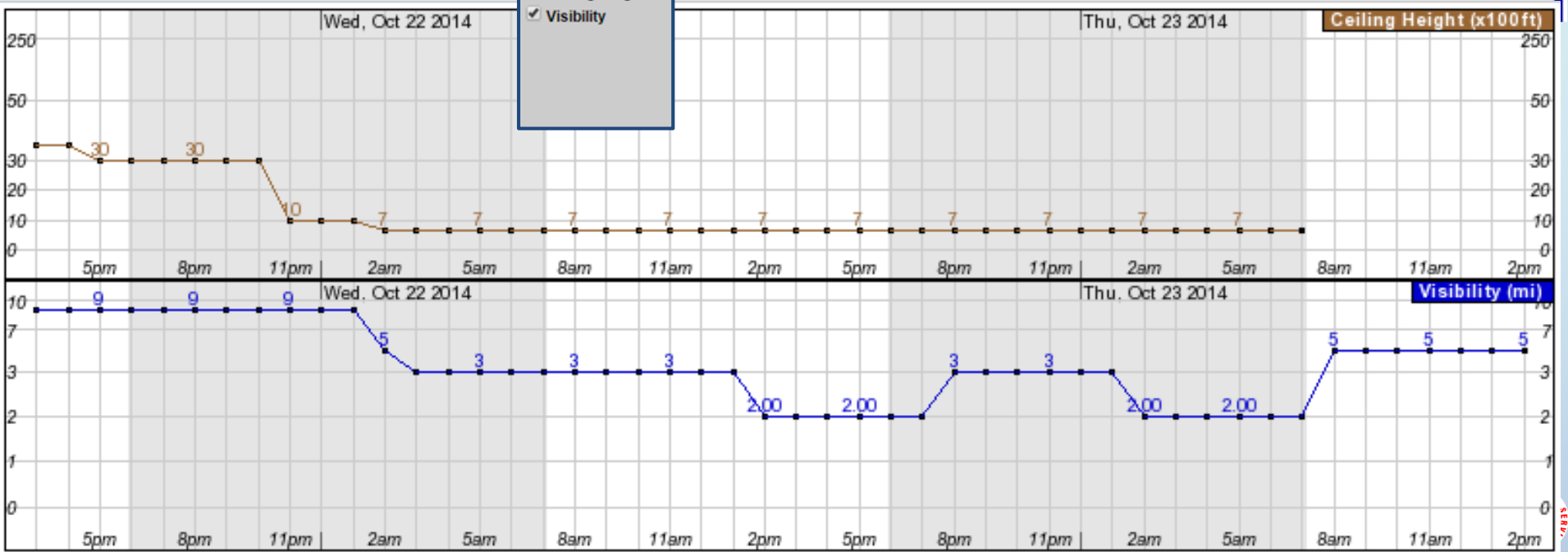


NDFD

Hourly Ceiling and Visibility available on Web

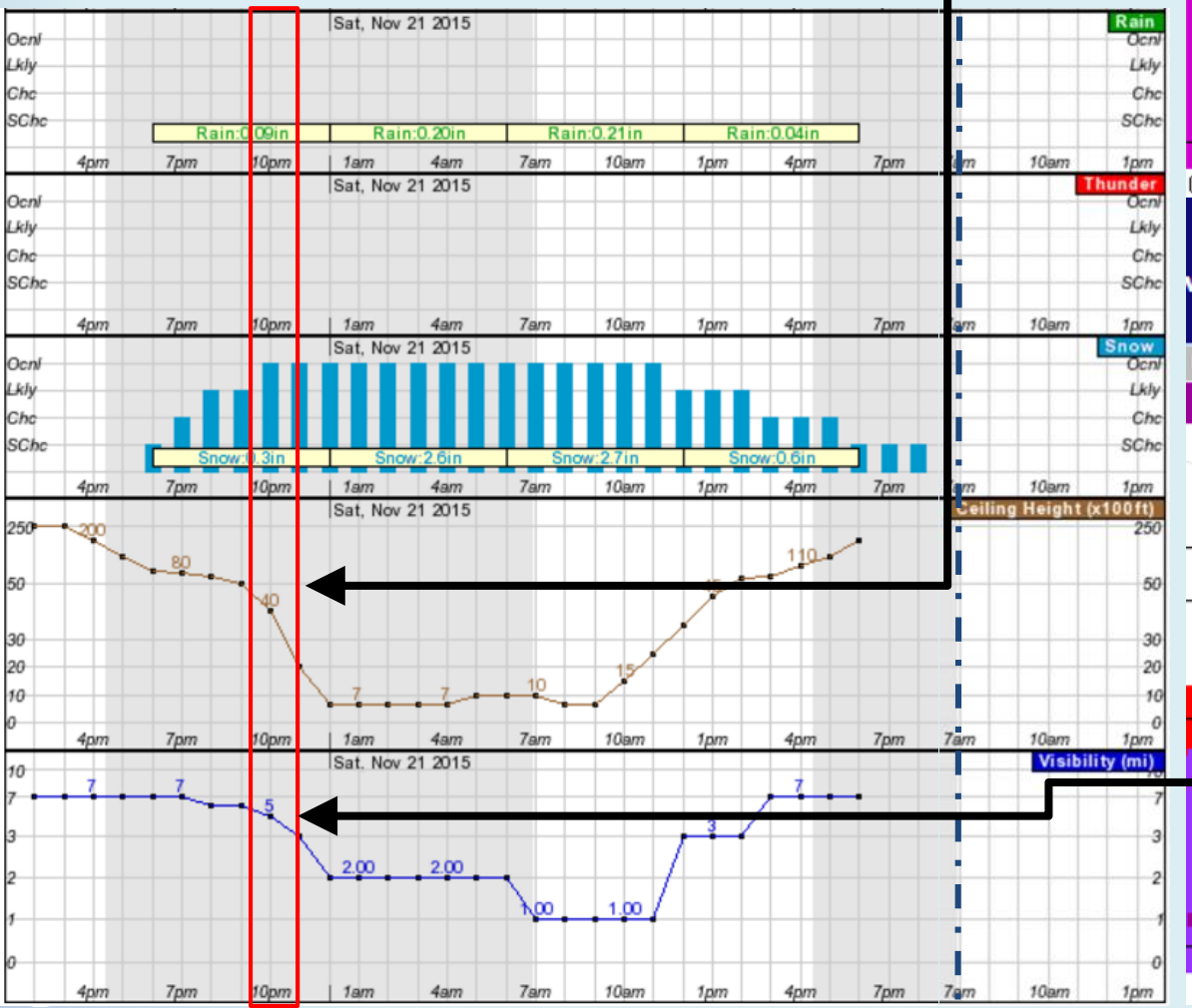
- Graphical Forecast Page
- Hourly Weather Graph

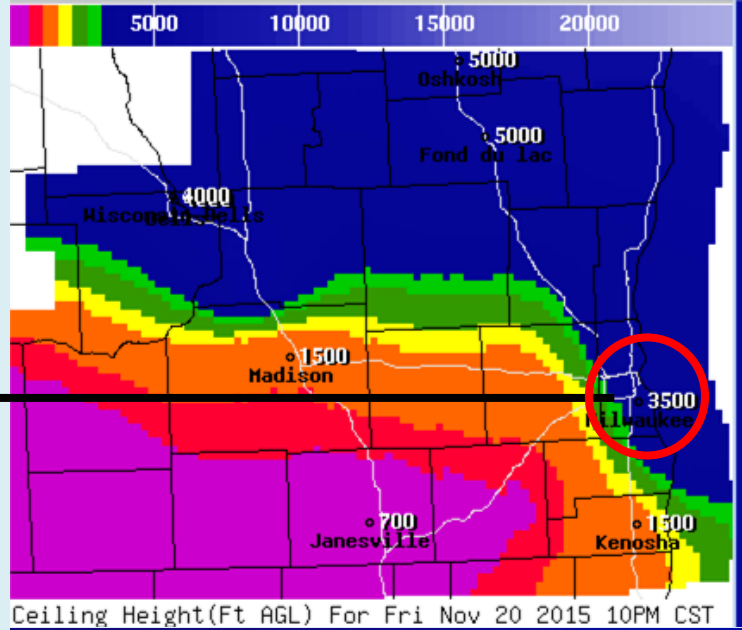


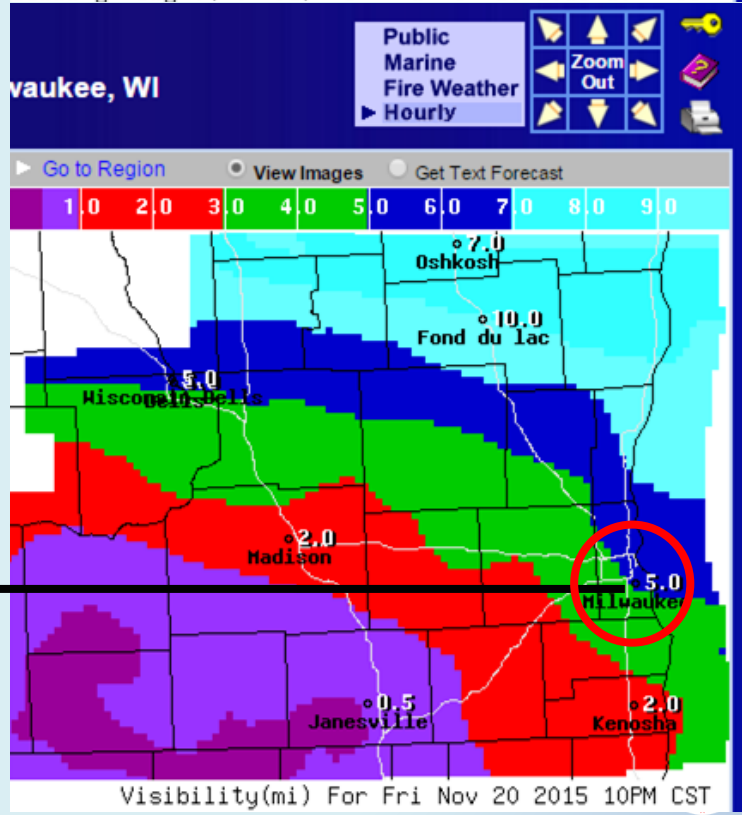


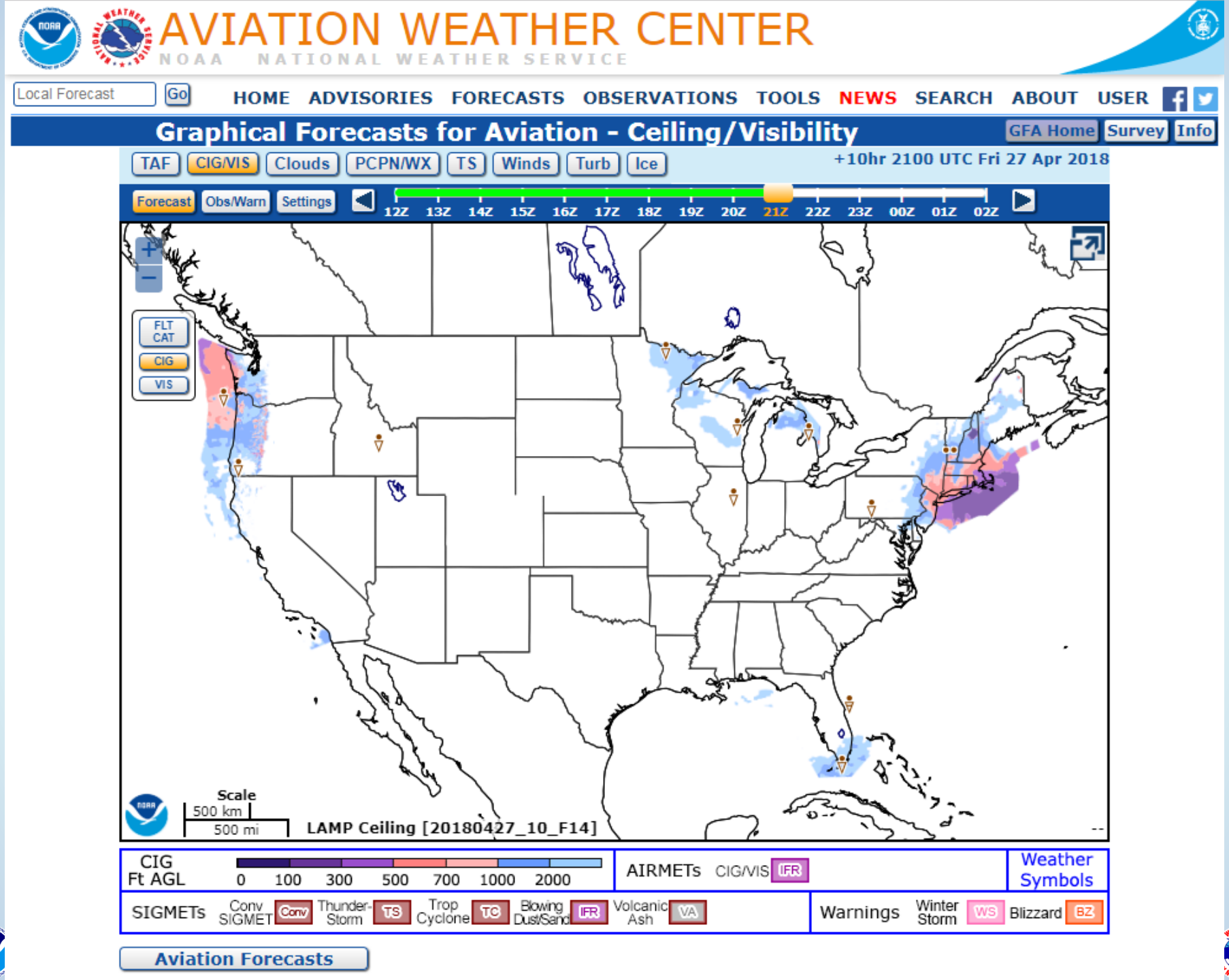
NDFD

Example during a
snow event
10 pm at MKE





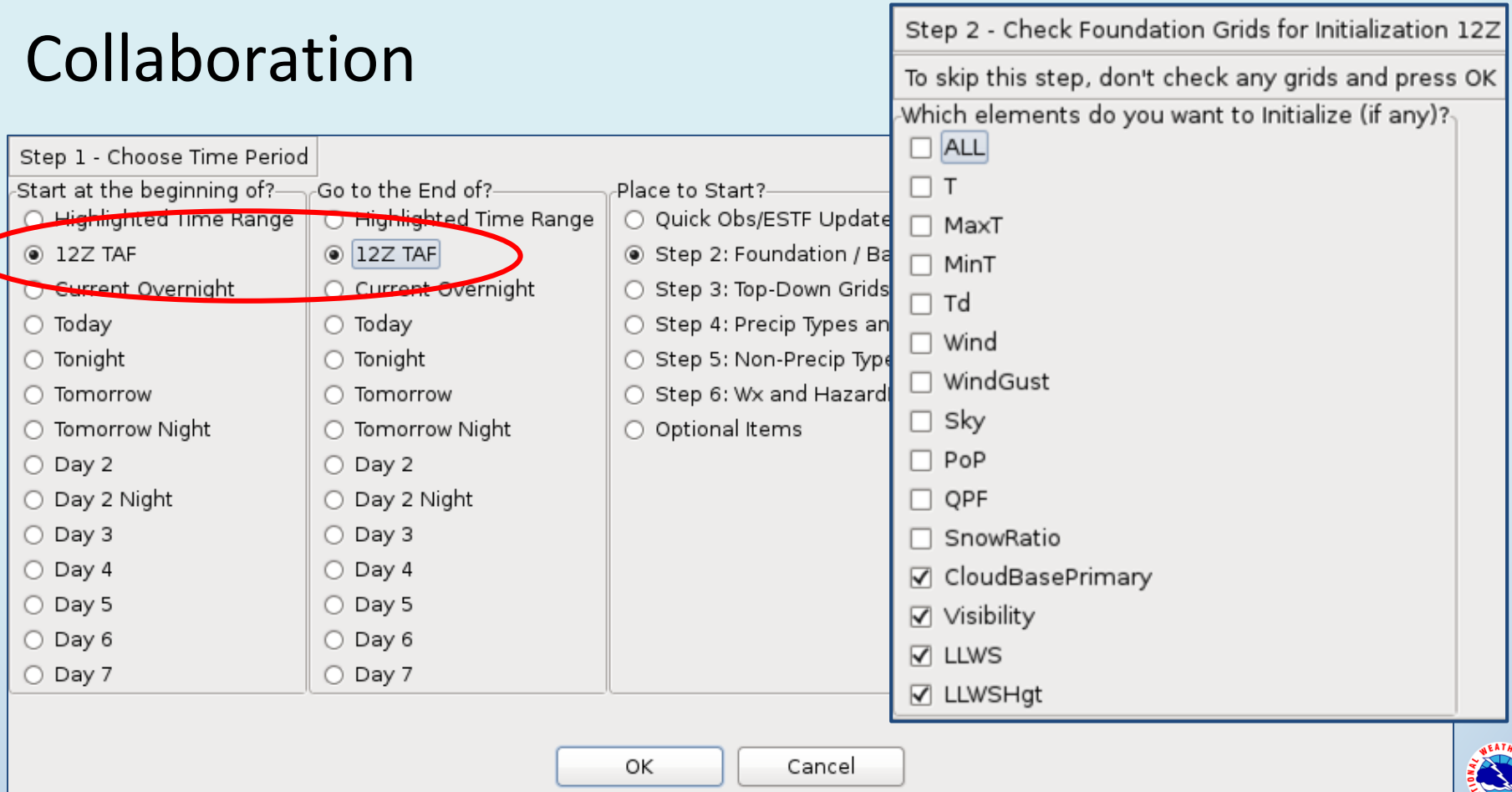



AVIATION WEATHER CENTER
NOAA NATIONAL WEATHER SERVICE
Local Forecast
Go
HOME ADVISORIES FORECASTS OBSERVATIONS TOOLS NEWS SEARCH ABOUT USER
Graphical Forecasts for Aviation - Ceiling/Visibility
GFA Home
Survey
Info
TAF
CIG/VIS
Clouds
PCPN/WX
TS
Winds
Turb
Ice
+10hr 2100 UTC Fri 27 Apr 2018
Forecast
Obs/Warn
Settings
12Z 13Z 14Z 15Z 16Z 17Z 18Z 19Z 20Z 21Z 22Z 23Z 00Z 01Z 02Z
FLT CAT
CIG
VIS
Scale
500 km
500 mi
LAMP Ceiling [20180427_10_F14]
CIG Ft AGL
0 100 300 500 700 1000 2000
AIRMETs
CIG/VIS
IFR
Weather Symbols
SIGMETs
Conv SIGMET
Conv
Thunder-Storm
TS
Trop Cyclone
TC
Blowing Dust/Sand
IFR
Volcanic Ash
VA
Warnings
Winter Storm
WS
Blizzard
BZ
Aviation Forecasts

Challenges

ForecastBuilder Evolution

Collaboration



DAS on its Way to Success!

- Common Starting Point Proven Effective
- Common Set of Tools/Methods
- Next:
  - Focus on Users
  - Aviation Weather Center Participation

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