

# Gap Analysis of Surface and Boundary Layer Data for the UAS and AAM Markets

James Ott

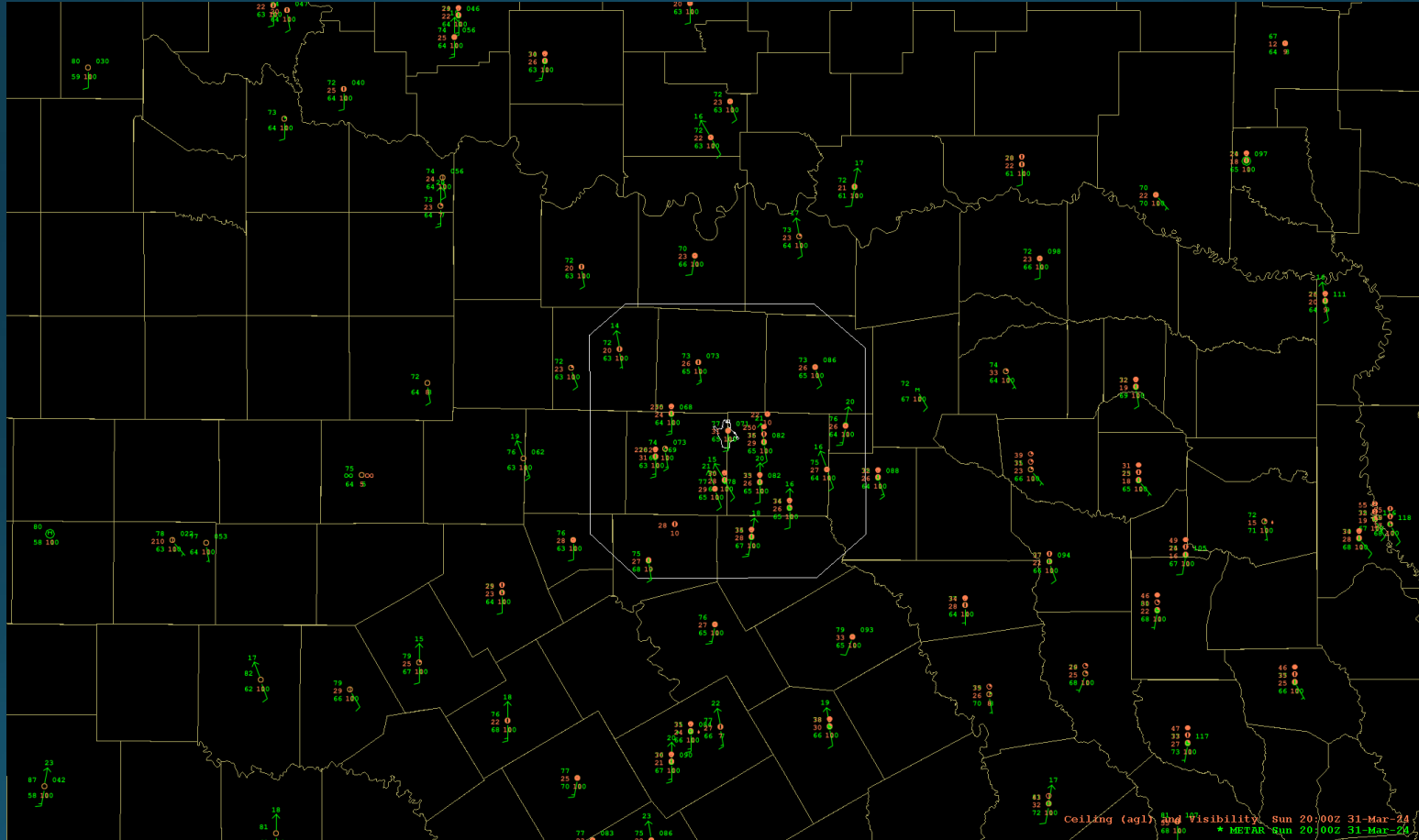
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Turbulent Aerospace

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# AWIPS



Observations  
are sparse

# Surface Observations

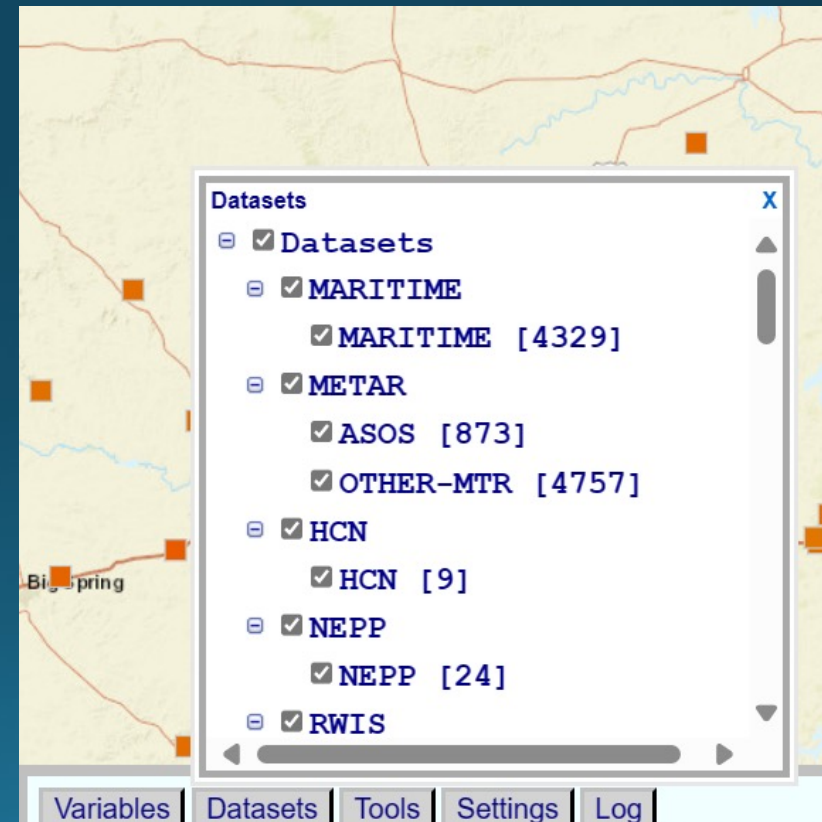
## Online Websites

- MADIS (Meteorological Assimilation Data Ingest System)  
<https://madisdata.ncep.noaa.gov/MadisSurface/>
- MesoWest  
[www.mesowest.Utah.edu](http://www.mesowest.Utah.edu)

# MADIS

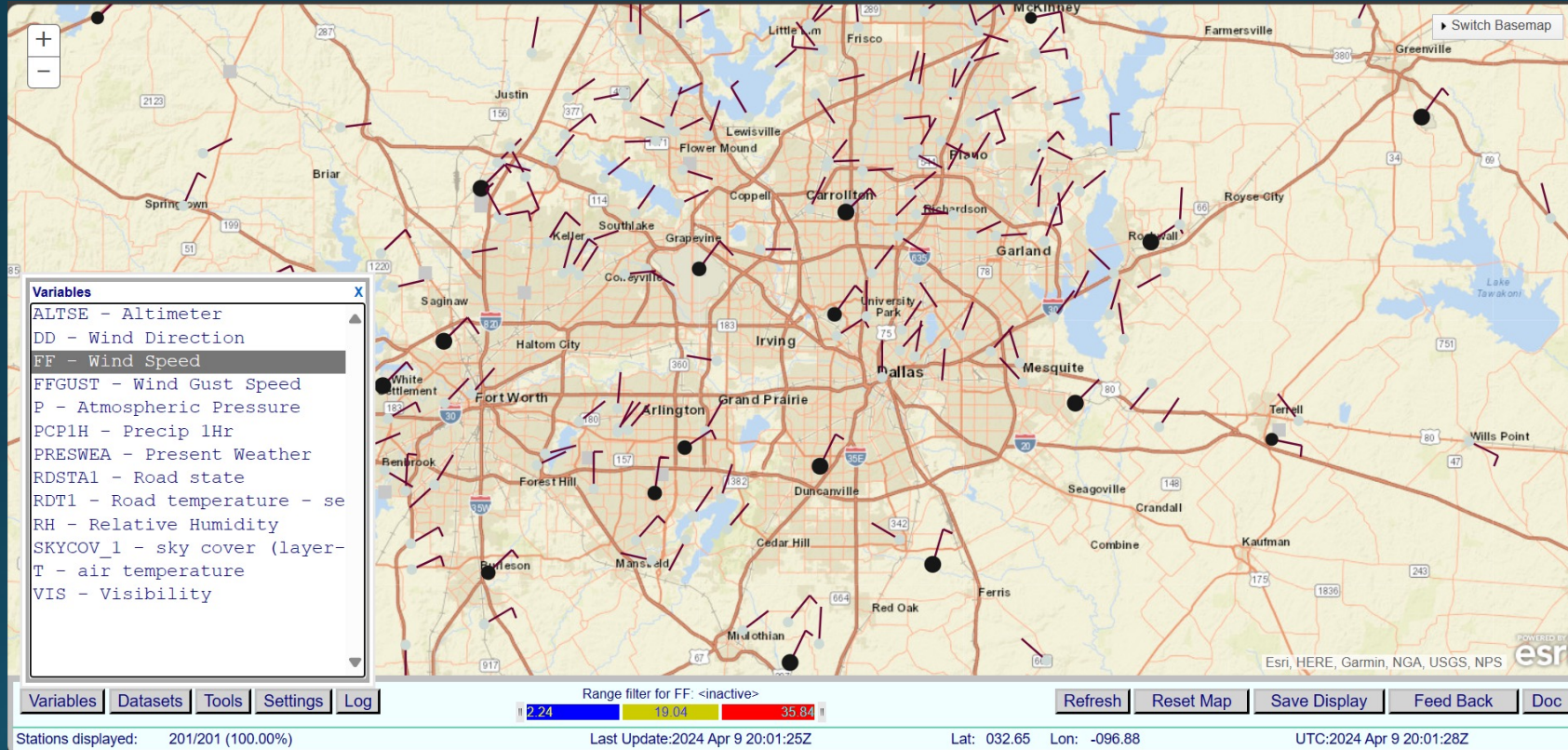
## Networks

- METARS
- Maritime
- State DOTs
- Mesonets
- MesoWest
- ARPSWXNET
- Etc....



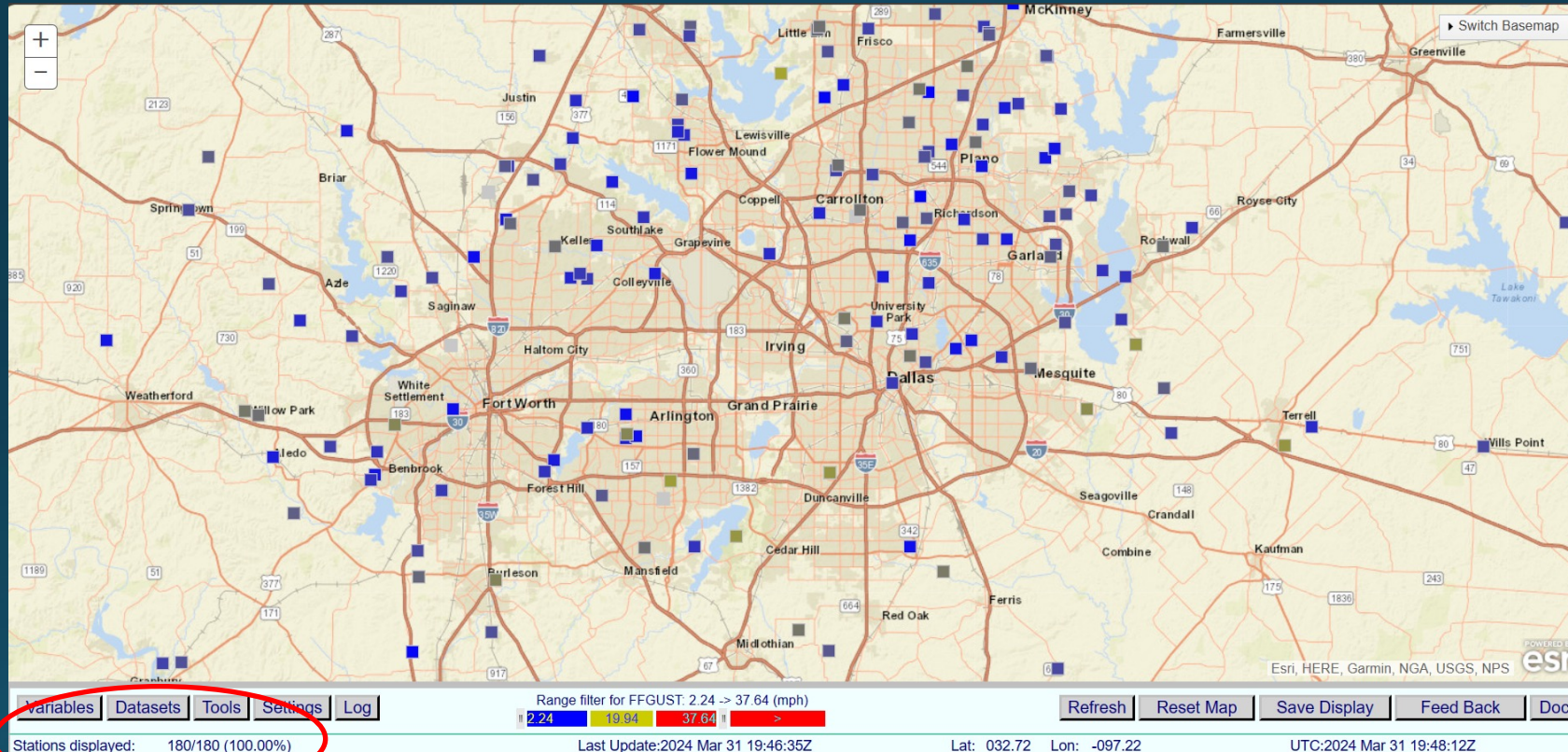
# MADIS

## Variables



# MADIS

## Wind Gust Speed



High density  
of observations  
Some areas  
represented  
better  
than others

# MesoWest

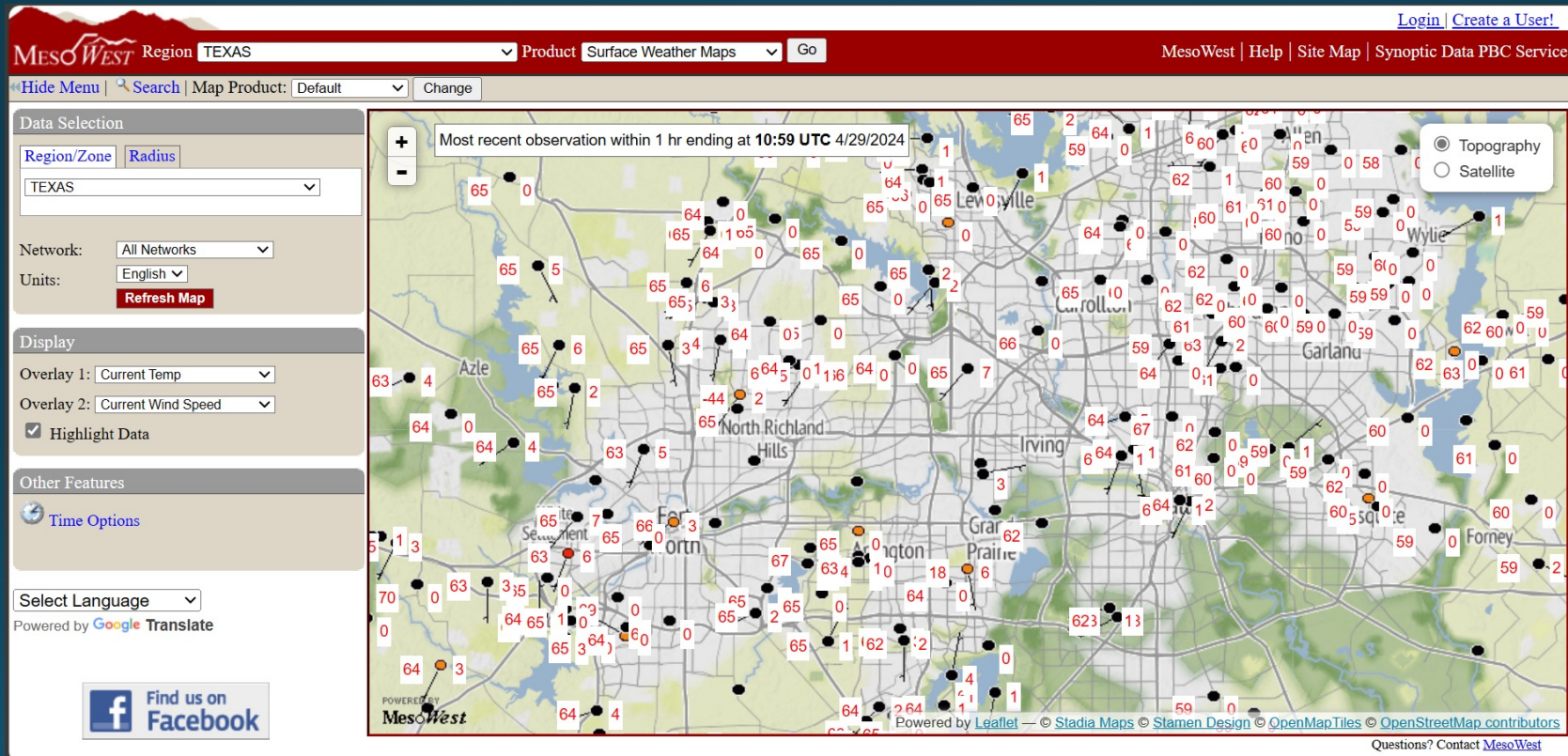
## Networks

- NWS and FAA (METARS)
- RAWS
- SNOTEL
- Utilities
- ARPSWXNet

The screenshot shows the MesoWest web interface. At the top, there is a red banner with the MesoWest logo and the text "Region TEXAS". Below the banner, there are navigation links: "Hide Menu", "Search", and "Map Product: Default". The main content area is titled "Data Selection" and contains several dropdown menus and a checkbox. The "Region/Zone" dropdown is set to "TEXAS". The "Network" dropdown is set to "NWS". The "Units" dropdown is open, showing a list of options: "NWS", "RAWS", "NWS and RAWS", "SNOTEL", "UTILITIES", "APRSWXNET/CWOP", and "All Networks". The "Overlay 1" dropdown is set to "Cu" and the "Overlay 2" dropdown is set to "-- None --". A checkbox labeled "Highlight Data" is checked.

# MesoWest

## Temperature and Wind Speed



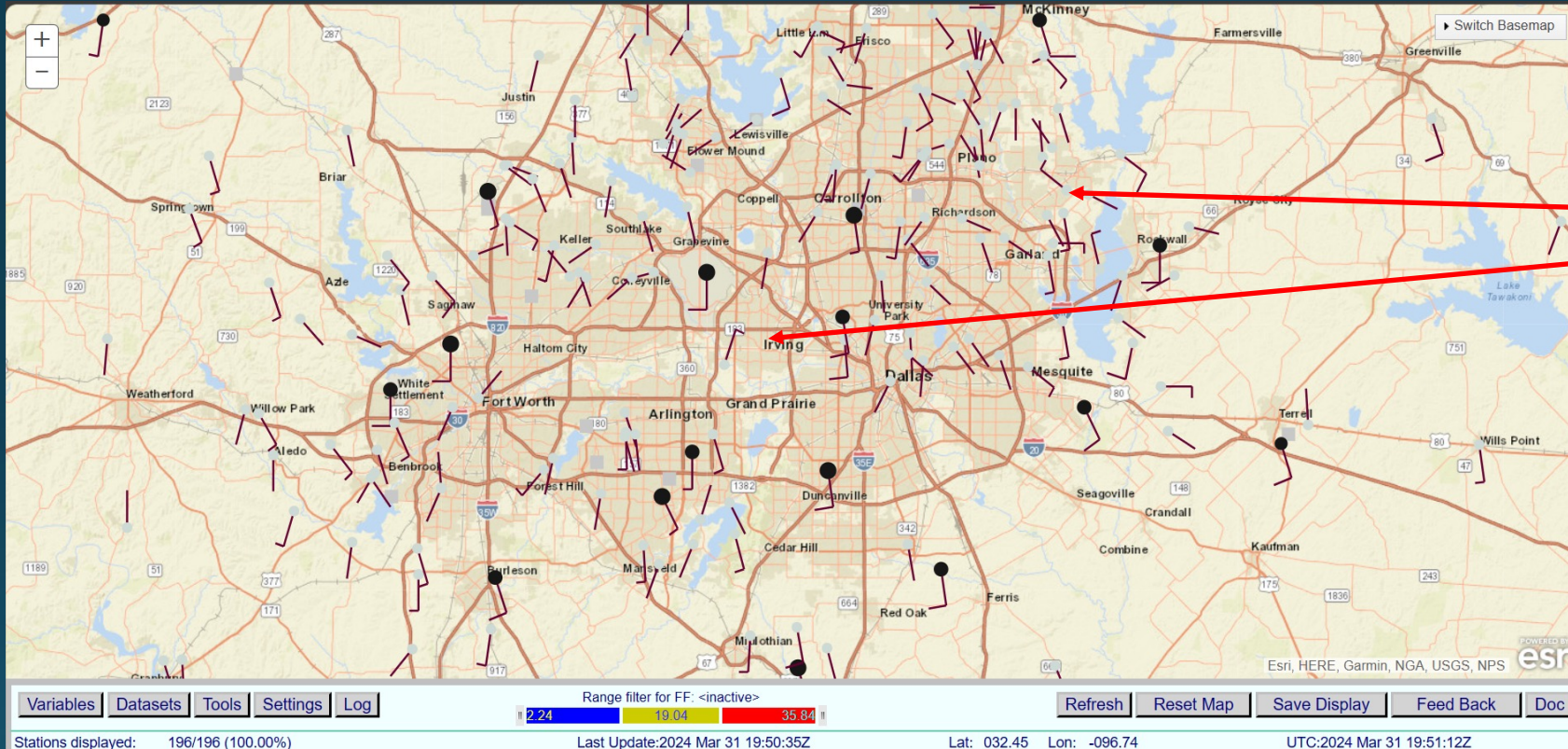


# Quality of Data

- Exposure
- Power
- Instrument Calibration (Qc checked on MADIS)

# MADIS

## Wind Speed



Unusual wind direction

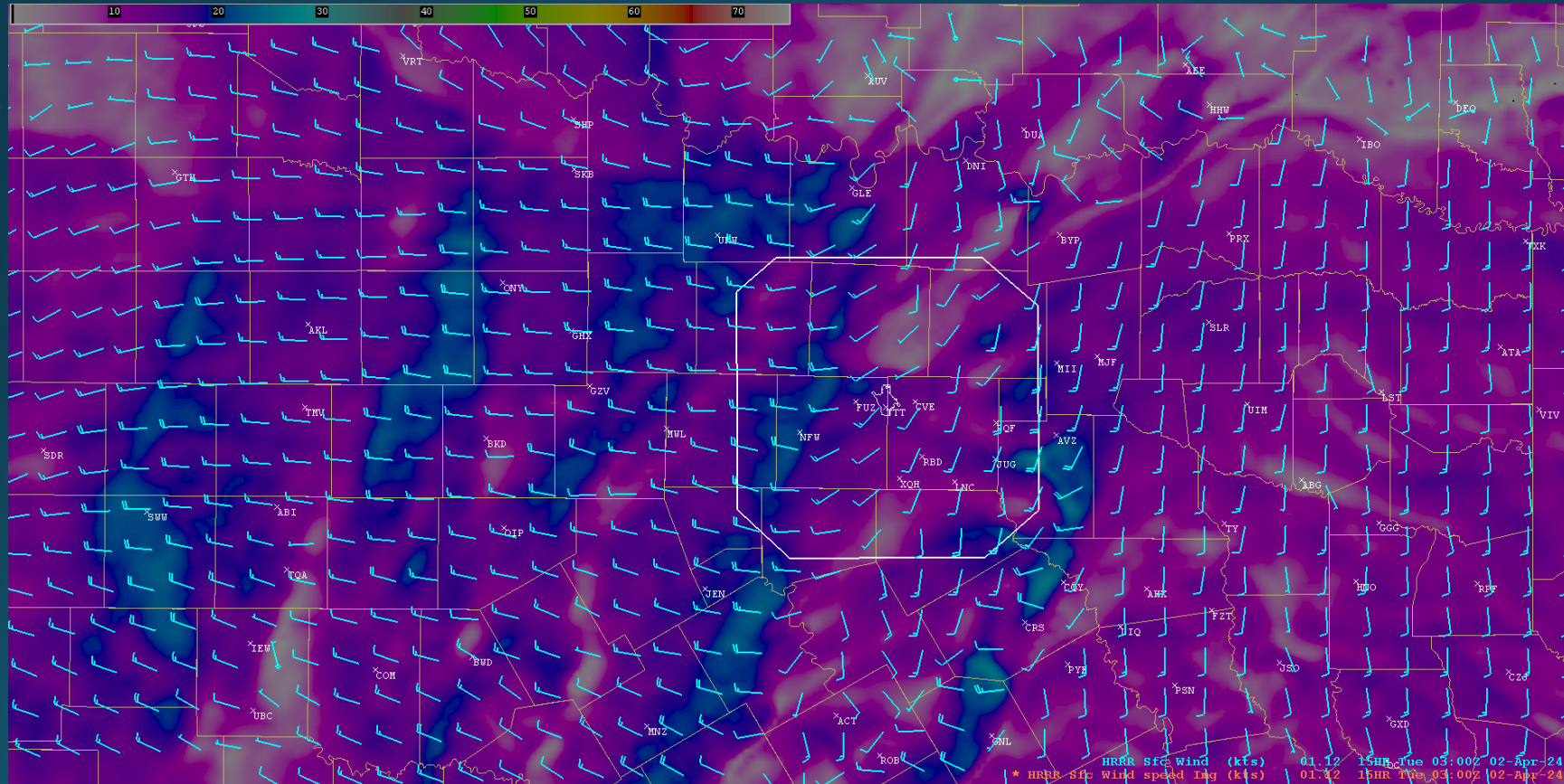
# HRRR Products

- 10m Wind
- Max 10m Wind (past hour)
- 10m Wind Gust Potential
- Aviation Flight Rules
- Suite of precipitation and winter precipitation products

**Is 3km resolution adequate?**

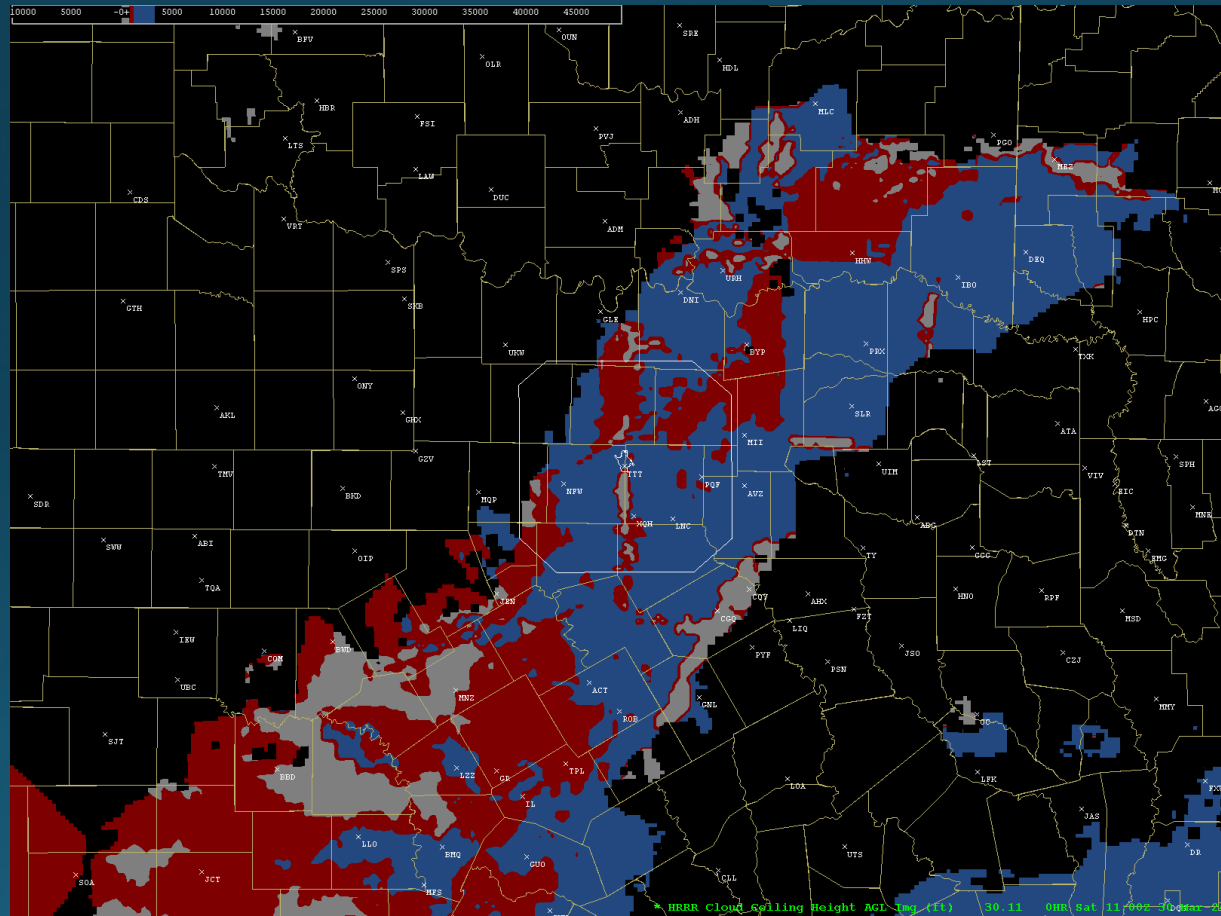
# AWIPS

## HRRR Surface Wind Forecast



# AWIPS

## HRRR Aviation Flight Rules



- MVFR
- IFR
- LIFR

# MADIS and MesoWest

## Advantages

- Several networks; large datasets
- Dense areas of surface observations, mostly in larger cities (150-250+)

## Disadvantages

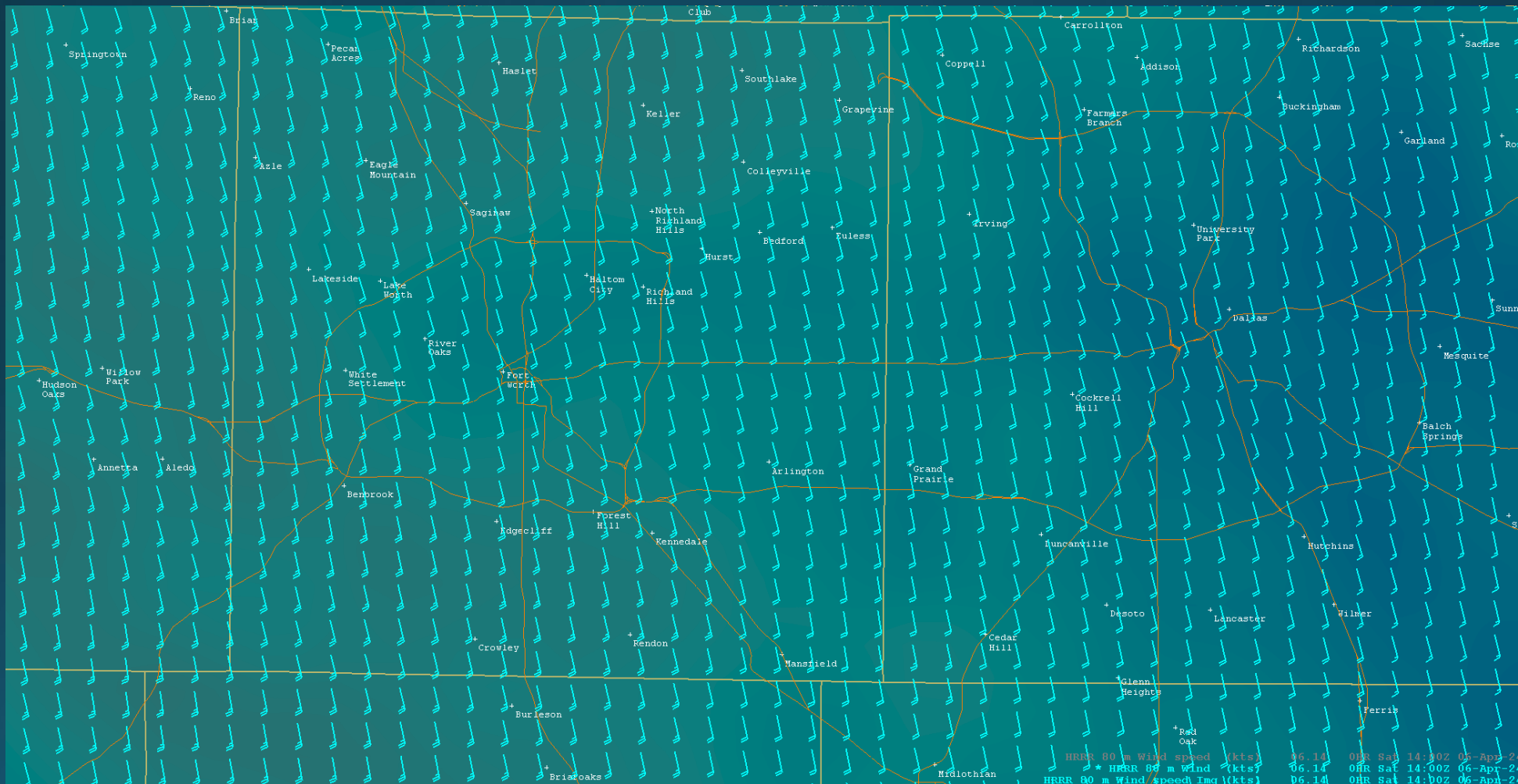
- Some information may be questionable
- Plot only 1 or 2 elements at a time

**AWIPS**

**Current Systems Capability  
Low Altitude Operations**

# AWIPS

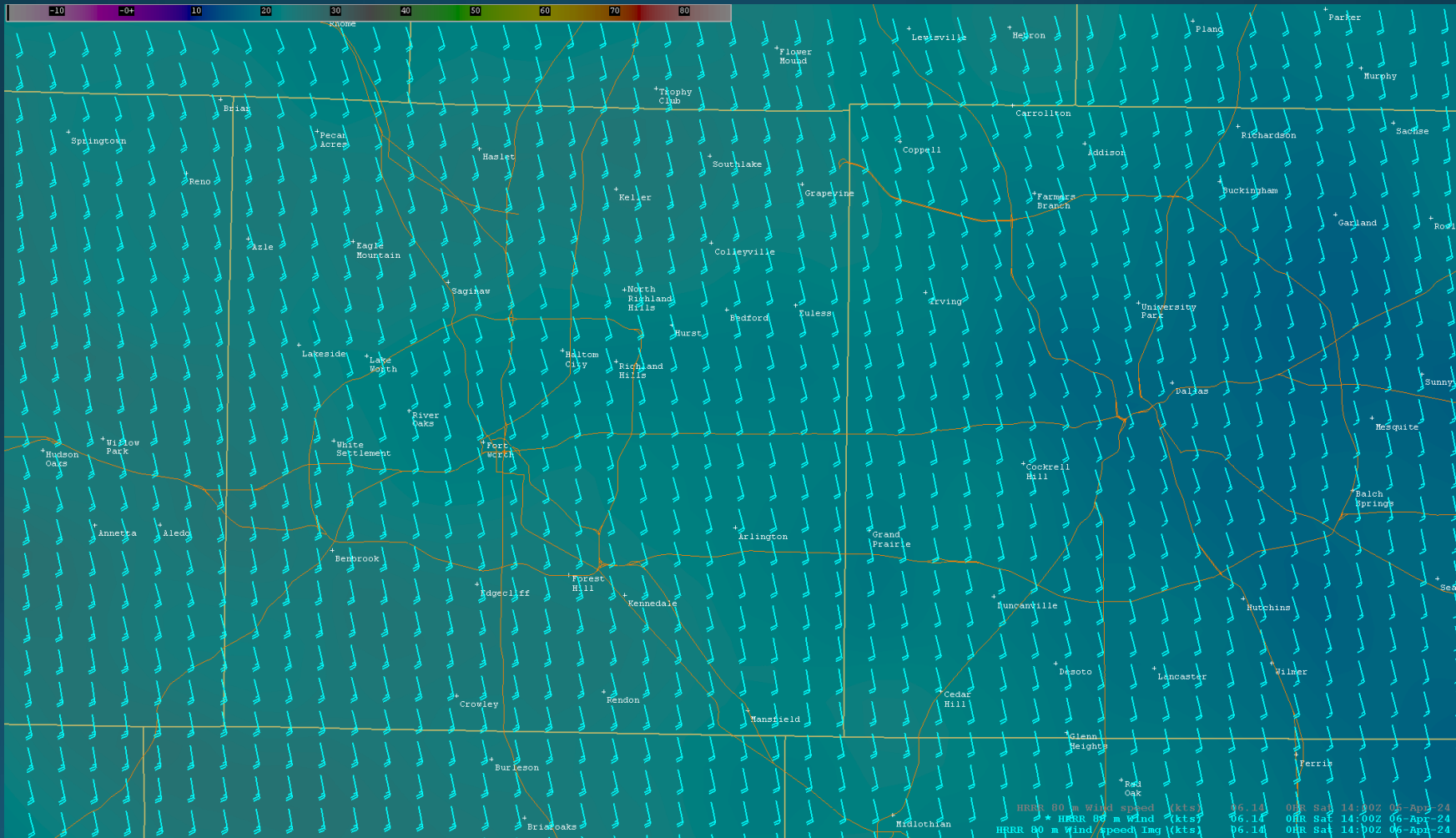
## HRRR 80M Wind Forecast





# AWIPS

## HRRR 80M Wind Forecast



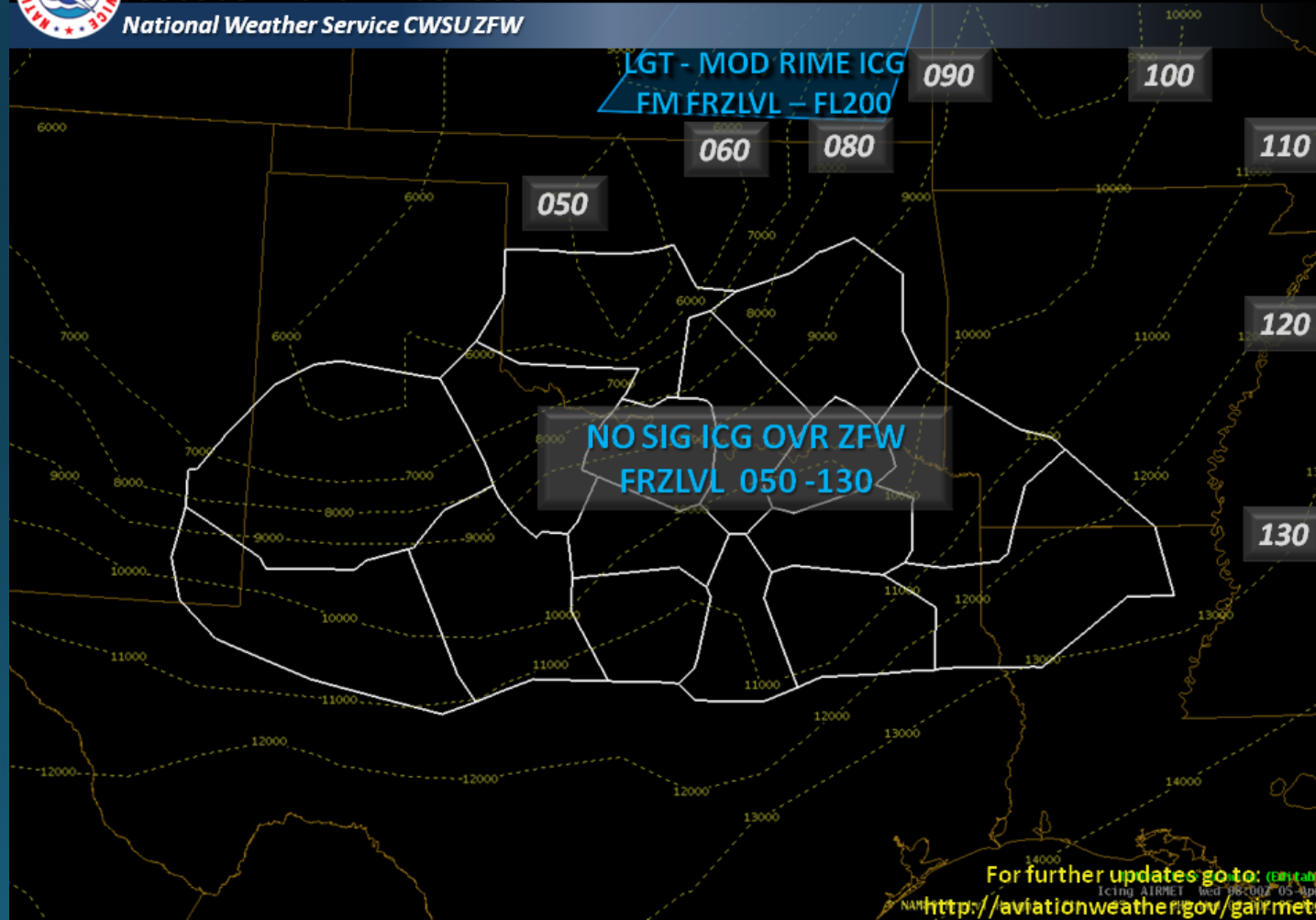


# AWIPS

## Icing Forecast



ZFW ICING FCST:  
050905Z Valid TIL 051500Z  
National Weather Service CWSU ZFW



For further updates go to: [aviationweather.gov/gairmets](http://aviationweather.gov/gairmets)

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