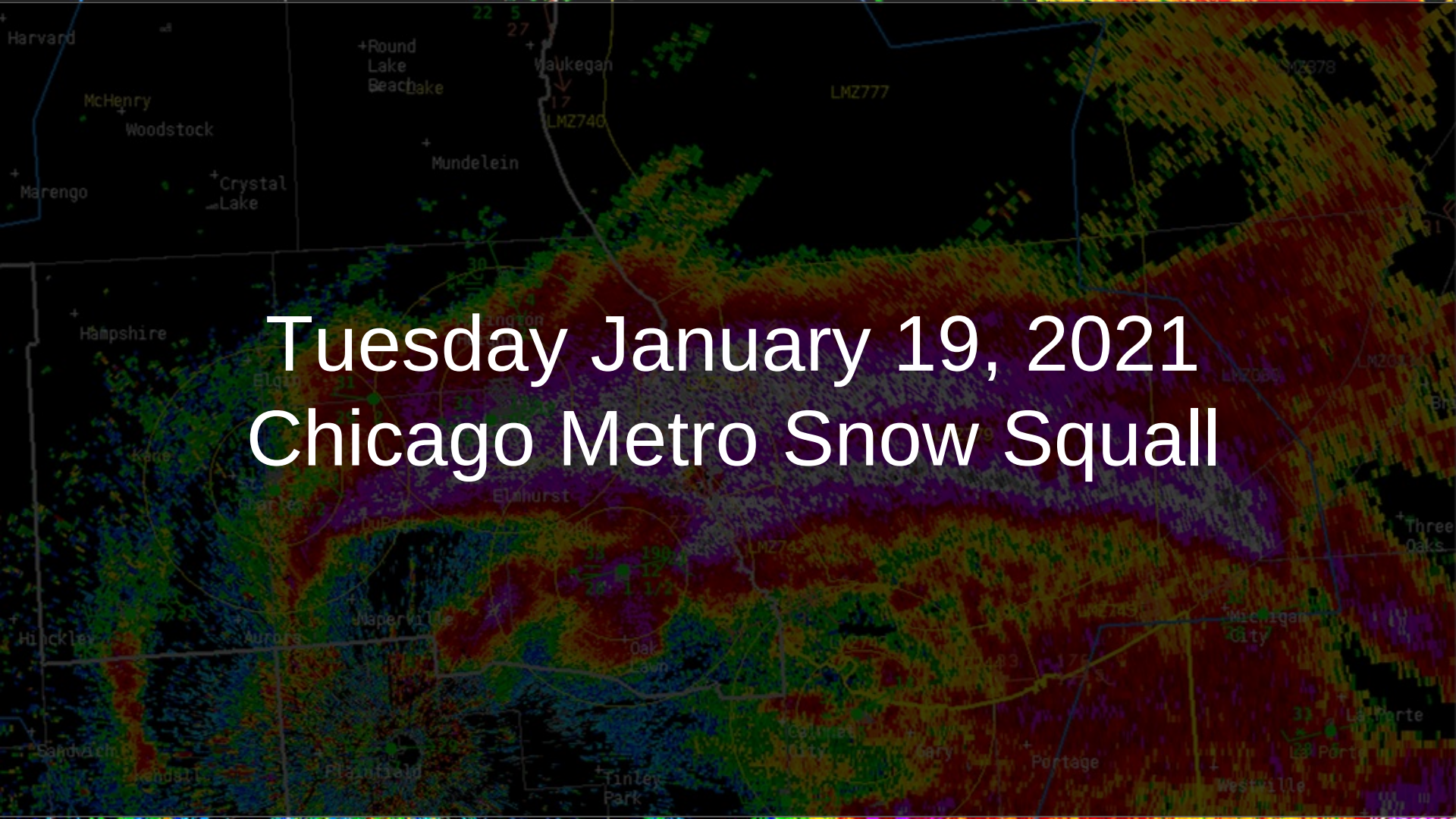


Tuesday January 19, 2021
Chicago Metro Snow Squall

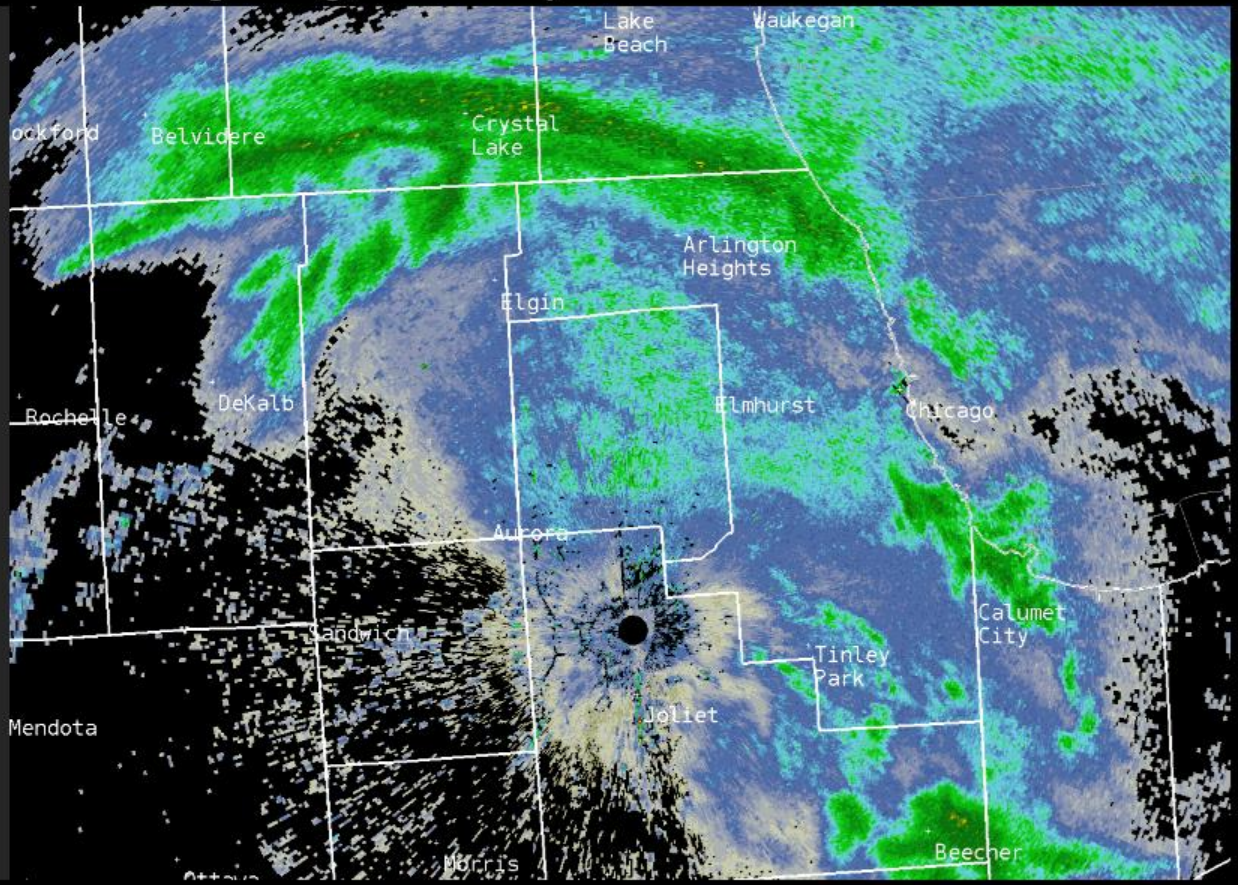
1/19/2021: Heavy Snow Band Plows through Chicago Metro

Near-Zero Visibility, Thunder and Lightning, and Heavy snow Rates

Snow Totals:

Bull Valley	3.4”
Crystal Lake	2.5”
Skokie	2.5”
Woodstock	2.5”
Morton Grove	2.4”
Evanston	2”
Roselle	2”

Several Reports of Lightning and Thunder



National Weather Service - Chicago

Radar from 8:08 PM CST

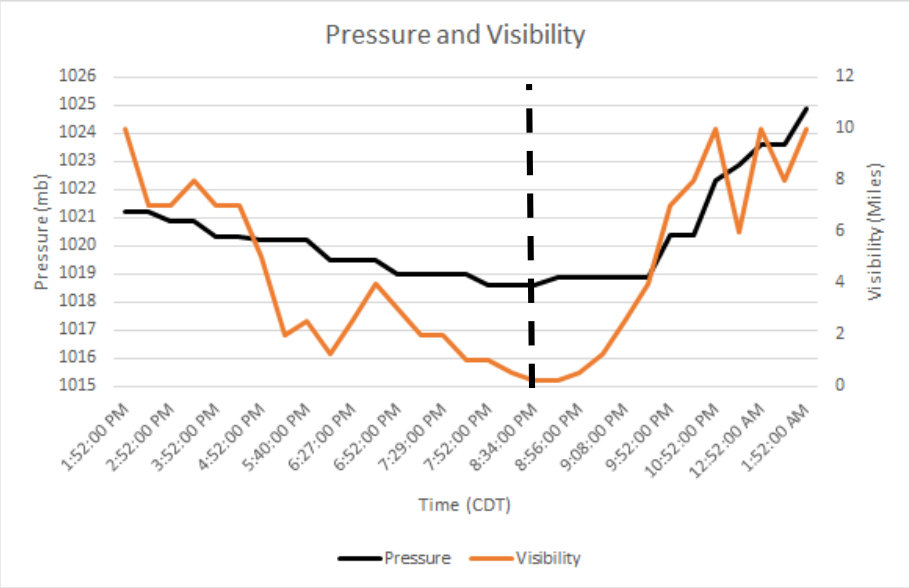
Fast Facts

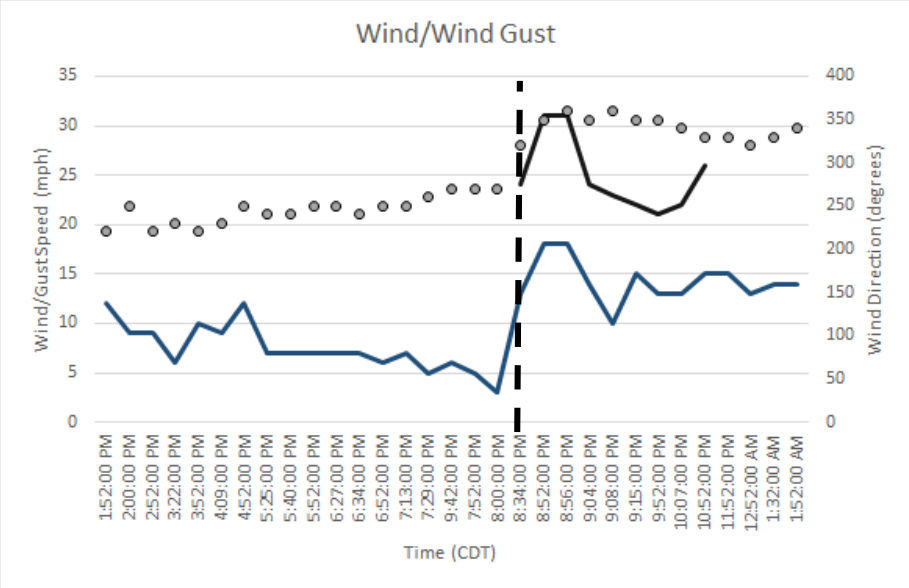
- Snow squall rushed through northeastern Illinois during the evening of 1/19/2021
- Under the band, visibility dropped to 1/4 mi, surface pressure rose 6 mb, and an abrupt northwesterly wind shift with gusts over 25 mph occurred
- Observed snow rates well exceeded 1”/hr, with an airline official at ORD estimating 1” fell in just 10 minutes
- Snow totals ranged from 1-4” across parts of Boone, McHenry, Lake (IL), northeast DuPage, and Cook counties
- Lightning & thunder were reported numerous times

Twitter Video of Thundersnow

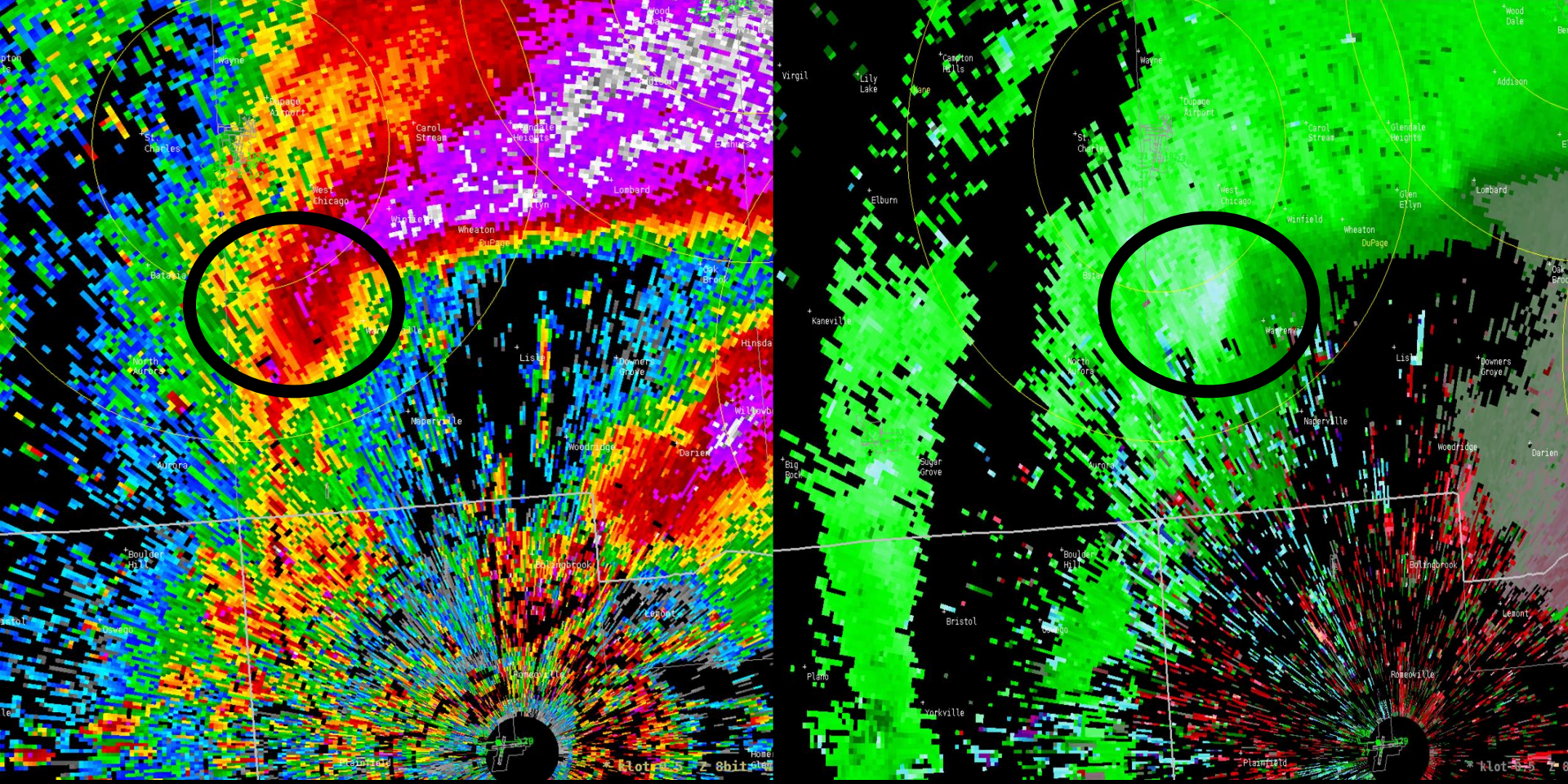
Lightning captured in Elgin, IL as the snow squall approached
(courtesy of @bluffcityjeff)

Observations at Palwaukee Airport (Wheeling, IL)





- Snow squall hit at approximately 8:34 PM CST
- Drop in visibility to ¼ mile, abrupt wind shift to out of NW with gust > 25 mph
- A 6 mb pressure rise followed by ~1 hour



40+kt (>45 mph winds) ~1600 feet above ground (from KLOT)

What did our forecast call for?

Potential for snow band was also mentioned in Aviation AFD issued at 5:29 AM morning of event

The latest few iterations of the RAP have become increasingly aggressive in showing the advection of a narrow plume of steep lapse rates into the snow growth zone this evening. Should the thermal instability become available, a narrow band of heavy snow characterized by snow rates approaching 1"/hr and visibility below 1/2SM may develop somewhere across northern Illinois (looking at 00-03Z for timing). At this point, it appears the best potential for such a band to develop would be south and west of all terminals. However, trends will need to be monitored closely.

Potential for burst of heavy snow was further discussed in 2:45 PM AFD, ~5 hours before event

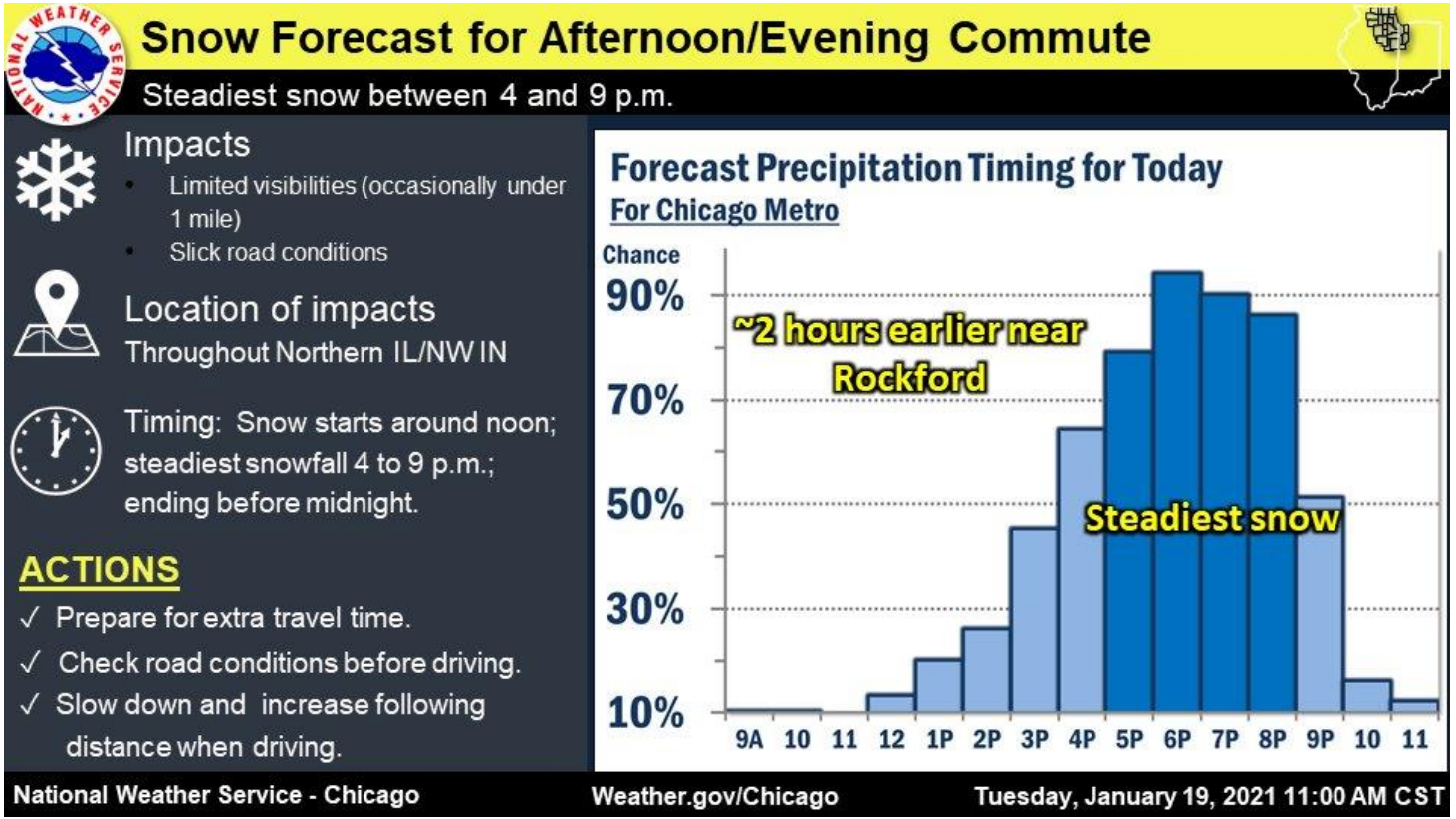
.SHORT TERM...
245 PM CST

Through Wednesday night...

The main forecast concern continues to be with the accumulating burst of snow expected early this evening. While snow amounts should be an inch or less in most locations, a narrow corridor of up close to 2 inches is possible over northern IL. The primary impacts will also occur during the evening commute, when the snow could fall at a decent rate. The general timing of this snow will be in the 4 to 7 pm window in the Rockford area, and more in the 5 to 8 pm timeframe for the Chicago metro area).

The main driver of this burst of snow is a clipper type system, currently shifting southeastward across northeastern IA. As this disturbance shifts over far northern IL early this evening, expect a band of snow to develop southward over the Rockford and Chicago metro areas during the times highlighted above. The snow is likely to fall at a decent clip given the presence of some very steep lapse rates from the surface up to just above 700 mb, so some rapid accumulations are likely, and this could make for some hazardous conditions for at least part of the evening commute. It appears the heaviest snow amounts, of an inch or two will be most favored north of the I-80 corridor. Expect the snow to come to an end from west to east after 9 pm this evening.

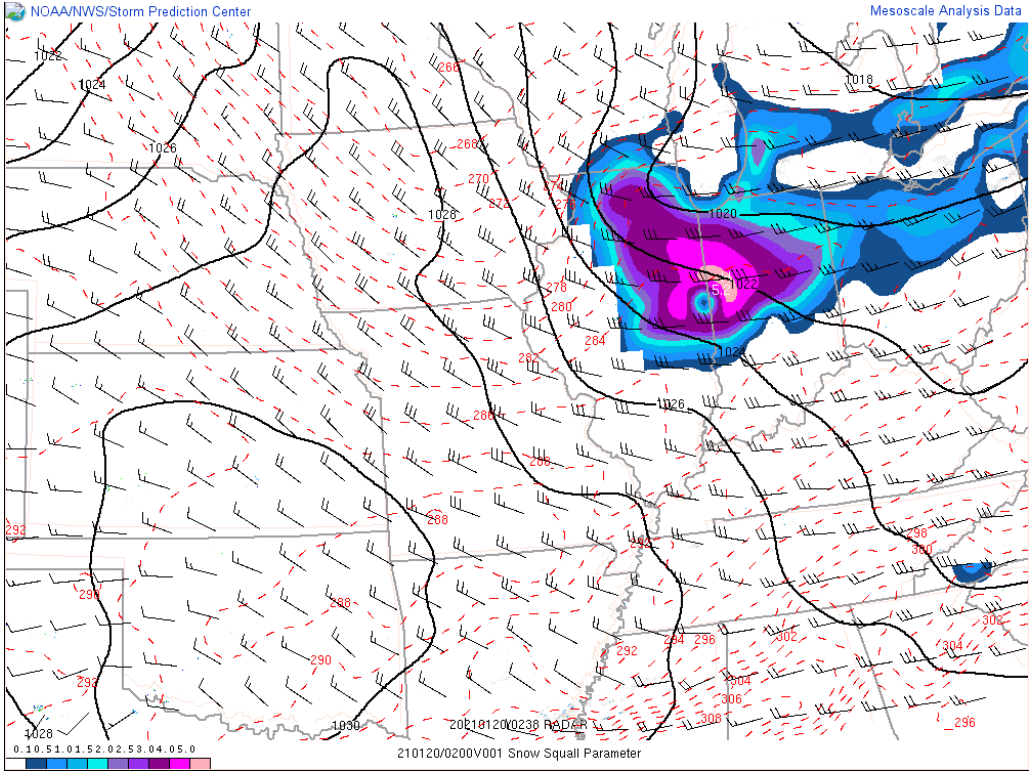
Graphic issued at 11 AM CST



Snow squall moved through Chicago metropolitan area between 8 and 10 PM CST

Brief Environmental Assessment of the Snow Squall

Snow Squall Parameter Approached Max. Values (SPC Mesoanalysis from 8pm CST 1/19)



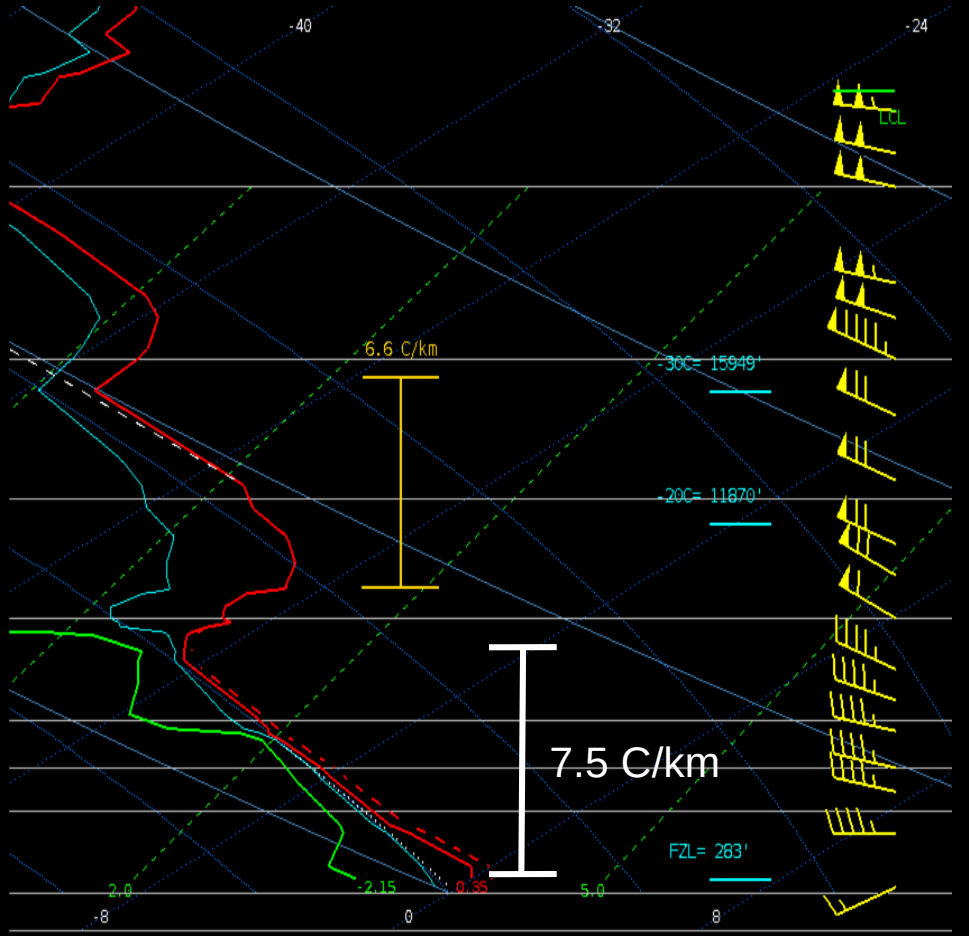
Intent of the snow squall parameter is to identify areas with low-level instability (often noted by steep low level lapse rates), sufficient moisture, and strong winds to support snow squall development.

The instability with the snow squall on 1/19 was enough to produce thundersnow! (pretty rare)

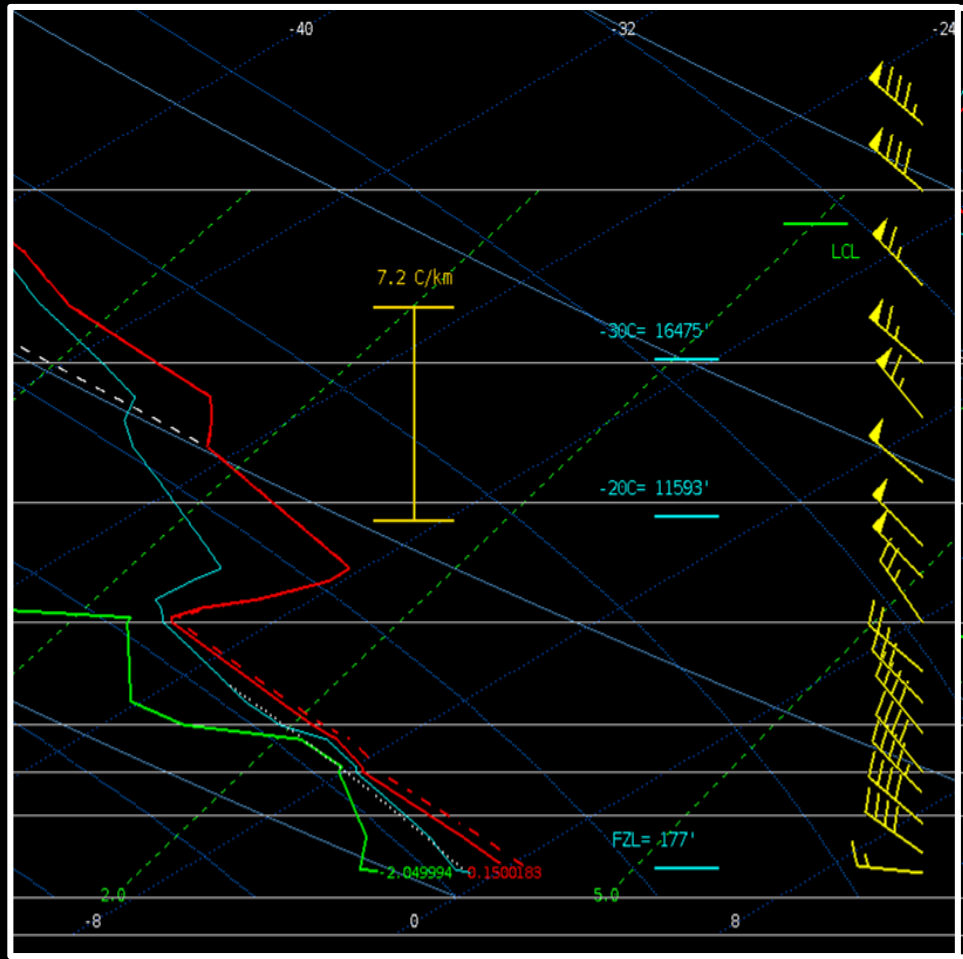
00Z RAOB from DVN

Note:

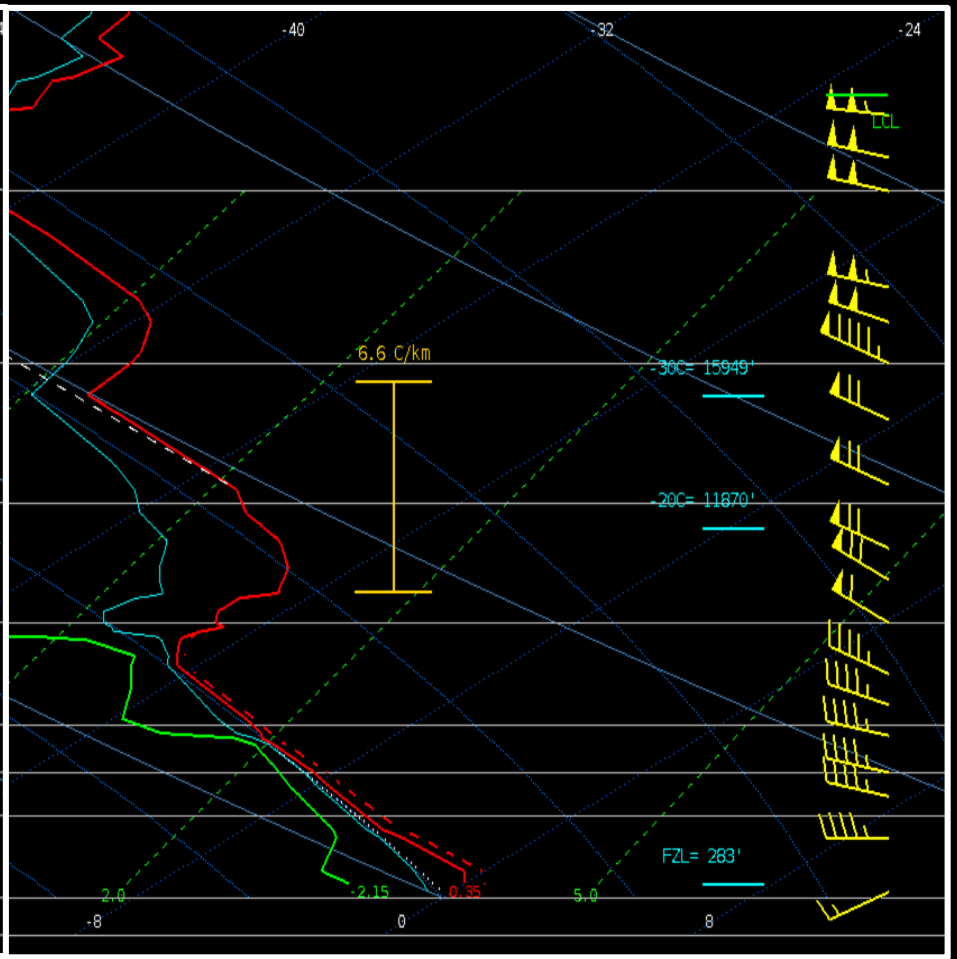
- Deep mixed layer with steep lapse rates of ~7.5 K/km (hand-calculated)
- ~45 to 50+ mph flow in the mixed layer
- 125 mph jet streak at 500 mb, indicative of strong upper-level jet streak



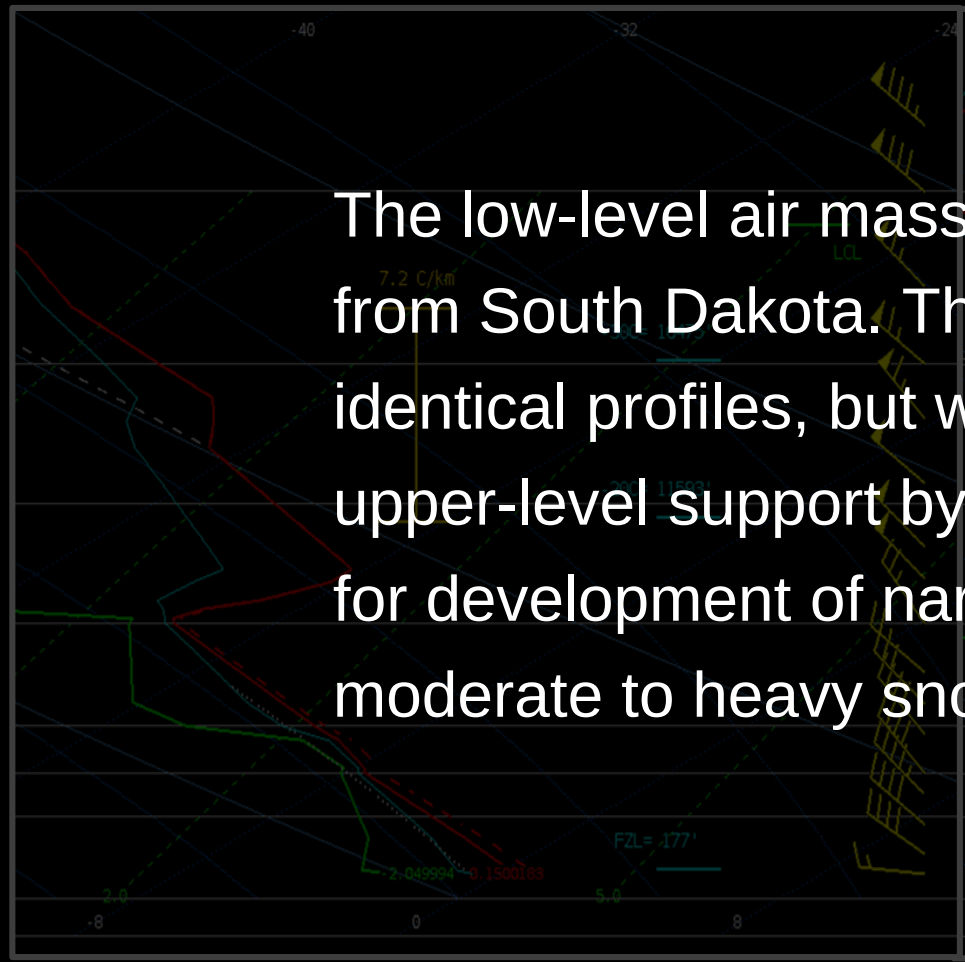
6 AM RAOB from Aberdeen, SD



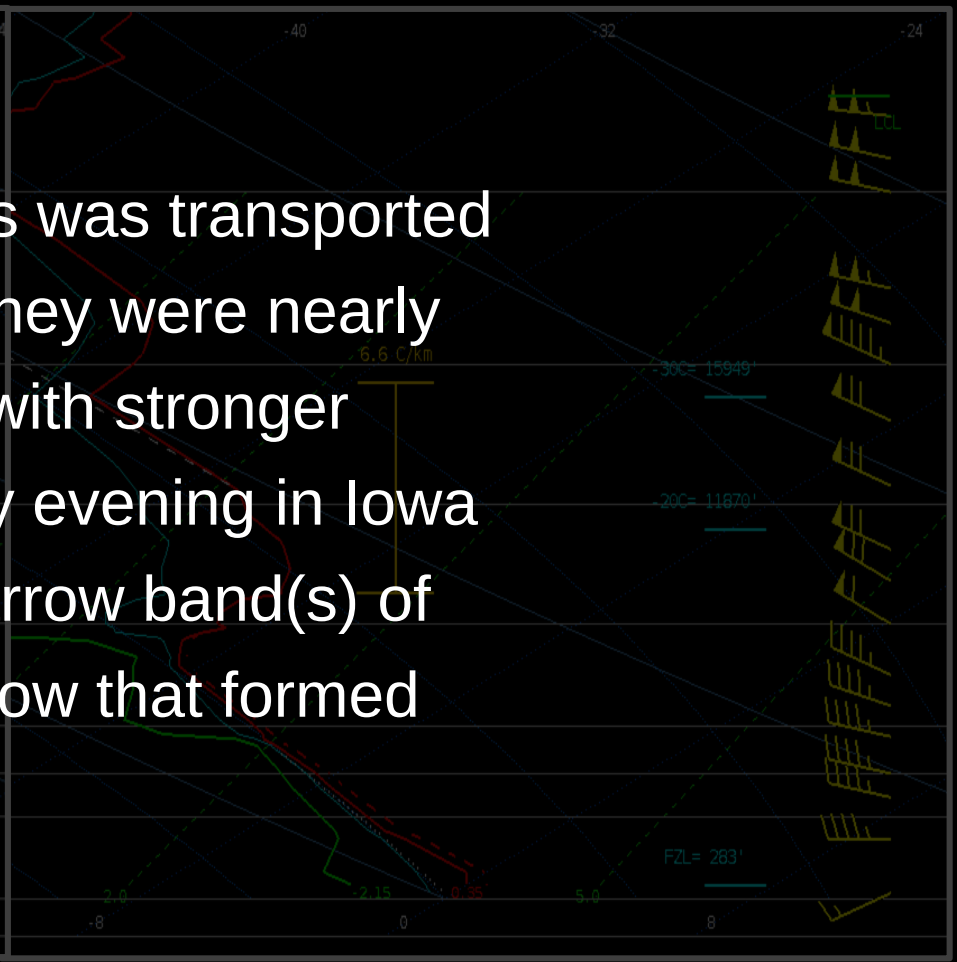
6 PM RAOB from Davenport, IA



12Z RAOB from ABR



00Z RAOB from DVN



The low-level air mass was transported from South Dakota. They were nearly identical profiles, but with stronger upper-level support by evening in Iowa for development of narrow band(s) of moderate to heavy snow that formed

Observed Snowfall

Very narrow band of 1-3” of snow, locally up to 4” (in darker blue shaded area), all of which fell in about 30 minutes to 1.5 hours!