Lake County SKYWARN

Weather Event Summary

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ARCTIC OUTBREAK – January 15th & 16th 2009

So how does this last arctic outbreak compare to past outbreaks? It can be difficult to compare because each outbreak has very different characteristics. Some come in with temps dropping 40 degrees in hours while others slowly creep in and sneak up on you. Our body reacts differently to each occasion. This outbreak was a typical one with a series of upper waves each bringing down colder air and strong winds producing wind chills to 35 below.

The last time temperatures were this cold was the first week of February 1996. Temperatures across the area were from -15 to -24 with an official low of -19 and a high of -5 for two consecutive days. At O'Hare the low in this outbreak was -18 with a high of -1 with a previous day's low of -13.

During the cold outbreak of 1996, a new state record was set at Congerville, IL with a low of -36. Our current outbreak produced a low of -31 at Aurora and -32 at Dixon.

A strange thing happened during this outbreak. The temperature at Rochelle dropped from -19 at 6:00 AM on Thursday morning to -37 at 7:00 AM. An 18 degree drop in one hour is suspicious. It was determined the equipment had malfunctioned but was fixed.

However, on Friday morning, Rochelle again dropped to -36 and this time had a partner in Sterling which also dropped to -36. Both stations had a very orderly drop in temperatures. None of these temperatures were reported officially, although it was mentioned by WGN-TV. The decision made by Illinois State Climatologist Jim Angel is that only NWS ASOS and Cooperative Observer reports will be used to determine official state records. The Cooperative Observer at Rochelle reported a low of -28, and the Cooperative Observer at Dixon reported a low of -32. The ASOS stations at Rochelle and Sterling are not under NWS control.

This doesn't mean it didn't happen. Arctic air is a very strange animal. The position of the high pressure area is important to record setting cold air. A high pressure over northwest Illinois or southwest Wisconsin between 3:00 AM and 6:00 AM is the best. This creates the calm winds needed to drop temperatures to record levels. Rochelle, Sterling, Freeport and Rockford were in the best conditions during this outbreak. Rockford set a record for the date at -25

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and was only 2 degrees from the all-time low, while Freeport was at -24. Also, lows of -30 in Moline, -32 in Dubuque and -34 in Cedar Rapids were observed.

Most forecast models don't handle arctic cold very well, especially when it comes to the warming that occurs after an outbreak. Arctic air of this magnitude tends to leave when it wants to. This type of cold is very dense and it's a tough job for warm air, which is lighter, to move it out.

When skies are clear, with light or calm winds and deep snow cover, arctic air takes on a life of its own. You can have a thermometer reading -22 and move just a few hundred feet and have it drop to -35. This is especially true at or just after sunrise. Just a little wind shift can move that -35 pocket of air right over the thermometer that just read -22. Another example of this phenomena occurred in McGrath, Alaska in the 1990's. McGrath set a state record low of -87.6. This station could have caught one of those cold pockets, or perhaps there was a -105 degree cold pocket not too far away. The colder the air, the bigger the difference can be. This especially occurs in river valleys, between hills and between mountain ranges. Ft. Yukon, Alaska is a common place for these cold pockets to form, as it is in a valley and also between mountain ranges. Another location with similar topography is Tok, Alaska, which had four mornings below -70 about 10 days ago. Perhaps this phenomenon is what happened at Sterling and Rochelle.

In the final comparison, this was the 2nd coldest outbreak since December 1983 when a record low of -25 was recorded. The coldest temperature since 1983 occurred in January 1985, when the all time record low temperature of -27 was reached. This was also the last time the temperature was officially -20 or below. There have only been 21 days where the temperature was -20 or lower. I would guess this outbreak ranks in the top 20 of our coldest outbreaks. If it had lasted another day or two, or if we would have been in the proper place as the stations out west were, it might have been in the top 10. However, the outbreak in December 1983 is far and away the biggest of all. I have listed below the temperatures for a 13 day stretch in December 1983. See what you think.

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Date	Low Temperature (°F)	Notes
18	-11	
19	-14	
20	-1	
21	16	
22	-18	
23	-21	
24	-25	Wind Chill: -55 | High: -11
25	-17	
26	-11	
27	8	
28	-1	
29	-8	
30	-6	

Table 1.0 – Low Temperatures for December 1983

The average low for those 13 days was -8 (25 degrees below average). This period also contained the longest consecutive stretch of below zero temperatures, adding up to 100 hours from December 22nd to December 26th.

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