

What are Cold-Air Funnels?



Fargo, ND experienced a very unique situation on Friday September 11. Emergency sirens were sounded with no warnings, watches or even advisories issued by the National Weather Service Forecast Office in Grand Forks or the Emergency Alert System (EAS) message scrolling across the TV screens. It came just as the school children were being dismissed. Some children were already in their busses. It was chaotic at first as schools children were called out of their busses back their schools where they sought shelter and safety. Parents were calling schools to assure their kids well being.

One might believe that the sirens were justified as the precautionary actions were small inconvenience compared to the alternative. Regardless, it is important that we educate ourselves to recognize funnels produce tornadoes and the ones that rarely do such as the cold air funnel that was sighted in Fargo on September 11, 2009.

Cold air funnels are rotating liquid droplets suspending in the air that emerge from the base of high convective cloud. They develop within cool low-level air, often associate with large scale upper level low pressure centers. When the sirens sounded, there was a large scale low pressure center in eastern North Dakota. It was even apparent on the radar animation as one clearly could see southerly flow in eastern North Dakota while the flow was northerly in central North Dakota, indicating counterclockwise rotation around this low pressure center.

Funnels normally emerge from Cumulus clouds that are found in the circulation of larger-scale, upper level cutoff low pressure centers. These cutoff lows are associated with cold and moist air similar to landspout tornadoes. However, vortices in cold air funnels are much weaker and short lived compared to landspout tornadoes. Moist air is lighter than dry air. At the same time cold air is heavier than the warm air. Because, cold air funnels are both cold and moist, both forces act against each other. Therefore, cold air funnels rarely touch the ground. When they do, they normally do not cause damage. Dust devils are the dryer counterparts of cold air funnels. Moisture content is the major difference between the two.

Human safety is the number one priority when it comes to emergency management. We cannot expect emergency personnel to risk the safety of the community when in doubt. The person who pushed the siren button on September 11 did the right thing by not taking any risks. It is, however, our responsibility to educate those whose responsibilities are to save lives so the public doesn't ignore future warning signals.