

# THE “WHYS” OF FREEZING RAIN

...Graham Saunders



Recently freezing rain affected a vast area in central Canada. A number of highways were closed and numerous school bus routes were cancelled. People assumed the posture of penguins as they shuffled over remarkably slippery driveways and walkways.

Walking up any kind of slope was especially challenging, something I know from personal experience. We take part in a rural car-pool system, which entails walking up a hill and then pick-up on a secondary highway. I stopped walking on an especially slick part, being fairly certain that the next step would result in a prone position. Then, and it was not my idea, I started sliding downhill backwards. So much for dignity; the solution was to crawl over the ice for about 32 feet.

The week before the rain a warm front extended from Saskatchewan over the Great Lakes and into eastern Ontario. The front separated relatively warm air from a cooler air mass to the north. Warmer air can override colder air and, if rain or drizzle begins in the warm upper layer, it cools as it falls through the lower layer.

The next stage depends on the thickness and temperature of the lower layer. If the layer of sub-freezing air is thick, say one quarter to one half mile, rain will partially refreeze. Bouncing ice pellets or sleet reach the ground.

If the layer is relatively shallow and/or well below 32f the rain or drizzle becomes supercooled. It still is liquid, but freezes on contact when it hits any object colder than 32f.

Duration of freezing precipitation can be critical, though even a thin glaze creates hazardous driving and walking conditions. Longer freezing rain events that persist for hours, or days (as the 1998 ice storm) can result in ice accumulations of several inches. The additional weight can bring down tree branches and power lines.

Warm fronts usually feature a broad band of cloud and slowly move north and east. A winter sequence of precipitation could be light snow, ice pellets, sleet, freezing rain or drizzle or rain when temperatures are above freezing.

This is busy enough, though the situation early in the week was even more complicated. This frontal system extended approximately 1200 miles and some sections stopped moving and other sections even moved south again and introduced a second session of freezing rain and drizzle in some locations. The situation featured temperatures around the critical 32f, melting if above and freezing if below.

Changes in elevation over short distances were enough to influence the temperature and change the type of precipitation. Hilly regions, notably around Lake Superior, made driving quite treacherous.

Ice is most slippery around the freezing point. The pressure of a tire or your foot can be enough to create a thin film of liquid water. It is ideal for reducing friction and increasing the potential for losing control.

Many areas had one to three hours of freezing precipitation, enough for a medium thickness of ice. This was often followed by rain – perfect if the goal is reduce friction. There were even problems for sanding trucks.

The ice storm had school bus cancellations and other consequences during three days. This is long for a freezing rain event and is related to the rain and the temperatures that followed. If it is rain, it is above 32f and pools of water should melt the ice below.