A diagnostic examination of the eastern Ontario and western Quebec wintertime convection event of 28 January 2010

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The priority of an operational forecast center is to issue watches, warnings, and advisories to notify the public about the inherent risks and dangers of a particular event. Occasionally, events occur that do not meet advisory or warning criteria, but still have a substantial impact on human life and property. Short-lived snow bursts are a prime example of such a phenomenon. While these events are typically characterized by small snow accumulations, they often cause very low visibilities and rapidly deteriorating road conditions, both of which are a major hazard to motorists.

On the afternoon of 28 January 2010, two such snow bursts moved through the Ottawa River Valley and lower St. Lawrence River Valley, and created havoc on area roads, resulting in collisions and injuries. Using the National Centers for Environmental Prediction (NCEP) North American Regional Reanalysis (NARR), we find that these snow bursts were associated with an approaching strong upper-tropospheric trough and the passage of an arctic front. While convection or squall lines are not common in January in Canada, we show that the snow bursts were associated with strong quasi-geostrophic forcing for ascent and low-level frontogenesis, in the presence of both convective and conditional symmetric instability, as evidenced by a deep Moist Absolute Unstable Layer (MAUL).

Finally, this presentation will highlight the need for the development of a standard sub-advisory criterion warning of short-lived but high-impact winter weather events, which operational forecasters can issue and quickly disseminate to the general public.