



iCAST: A Thunderstorm Nowcasting and Alerting Prototype Focused on Optimization of the Human-Machine Mix

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Severe thunderstorm nowcasting in Canada faces a number of challenges. At each of Environment Canada's five Storm Prediction Centres, staffing is modest and the area of responsibility is immense - more than 1,000,000 km squared. Forecasters must monitor data from a large number of sources, including ten or more radars, to maintain situational awareness.

In addition, storm development in many regions is significantly influenced by mesoscale features (e.g., dry-lines, sea/lake-breeze fronts). Thus, nowcasting in Canada requires intensive use of mesoscale data, both from observations and NWP.

A system combining the integrated representation of observational data, NWP, and automated algorithm output with an intuitive forecaster interaction interface is needed. It is recognized, however, that such a system needs to be carefully designed so that it does not erode - and in fact enhances - forecaster expertise. Thus, the human-machine mix must be optimized to make the best use of both human and machine strengths.

To this end, a thunderstorm nowcasting and alerting prototype named iCAST (interactive Convective Analysis and Storm Tracking) is being developed. It uses an area-based, object-oriented approach that allows forecaster interaction with graphical 'MetObjects' representing important features such as fronts, jets, and tracks. iCAST ingests high-resolution satellite and radar data, surface station observations, and lightning network data as well as NWP and NWP-based statistical guidance.

iCAST has been evaluated in a real-time, operational setting during the past several summers via a Research Support Desk at the Ontario Storm Prediction Centre in Toronto, and will serve as the basis for a 'next generation' nowcasting and alerting demonstration during the 2015 Pan Am Games in Toronto. It is anticipated that successful components of the iCAST prototype will be proposed for transfer to Environment Canada's national forecaster workstation (NinJo).