

SEVERE WEATHER IS THE NUMBER ONE RISK TO MUNICIPALITIES IN ONTARIO

Ontario is located in a seasonal battleground between conflicting warm air mass intrusions from the south and cold arctic outbreaks from the north that exposes residents to a continual series of severe weather driven events. Snowstorms, ice storms, tornadoes, windstorms, lightning/thunderstorms, forest fires, drought, cold and heat waves, and flooding result in considerable damage to property, livelihoods, natural heritage but, above all, threaten the lives of Ontario residents. Most recently, seventeen¹ tornadoes touched down across Ontario on August 20th, 2009 damaging more than 600 homes in Vaughan and leaving one young person dead in Durham.

In 2003, the Ontario government took action, through proclamation of Bill 148 or the Emergency Management Act (now the Emergency Management and Civil Protection Act) to “improve and promote the sustainable management of hazards and to encourage communities to achieve acceptable levels of risk”. The legislation required all 444 Ontario Municipalities to undertake a Hazards Identification and Risk Assessment (HIRA) process to identify priority risks to infrastructure and public safety and to develop prioritized emergency preparedness plans for each of the top ranked risks. In support of the Act and in partnership with Emergency Management Ontario, Environment Canada developed an Atmospheric Hazards website (www.hazards.ca) to share peer-reviewed data and information on atmospheric and climatological hazards in Ontario. Emergency Management Ontario (EMO) undertook the HIRA training of staff in each Municipality giving them a December 2004 deadline for reporting their top ranked risks. Since that date, many Municipalities have updated their HIRA analyses and rankings while some have shared their analyses publicly but overall, there has been no Province-wide compilation of the results.

Recently, Environment Canada, working with Emergency Management Ontario, conducted a survey of all Ontario Municipalities in order to compile a composite ranking of the hazards facing these communities. Many of the responding Municipalities identified atmospheric or weather-related hazards among their top-ranked risks to their communities and infrastructure. For example, almost half of the responding Municipalities identified tornadoes in their top 10 risks. Municipalities overwhelmingly named severe weather events as their number one risk, where severe weather events are defined by snowstorms/blizzards, ice storms, tornadoes, lightning/thunderstorms, windstorms and hail storms.

Based on the survey, Figure 1 illustrates the summary rankings of all weather and non-weather risks identified by responding Ontario Municipalities.

¹ As of September 22, 2009. The final official tornado tally could be higher as damage investigations are continuing within Environment Canada.

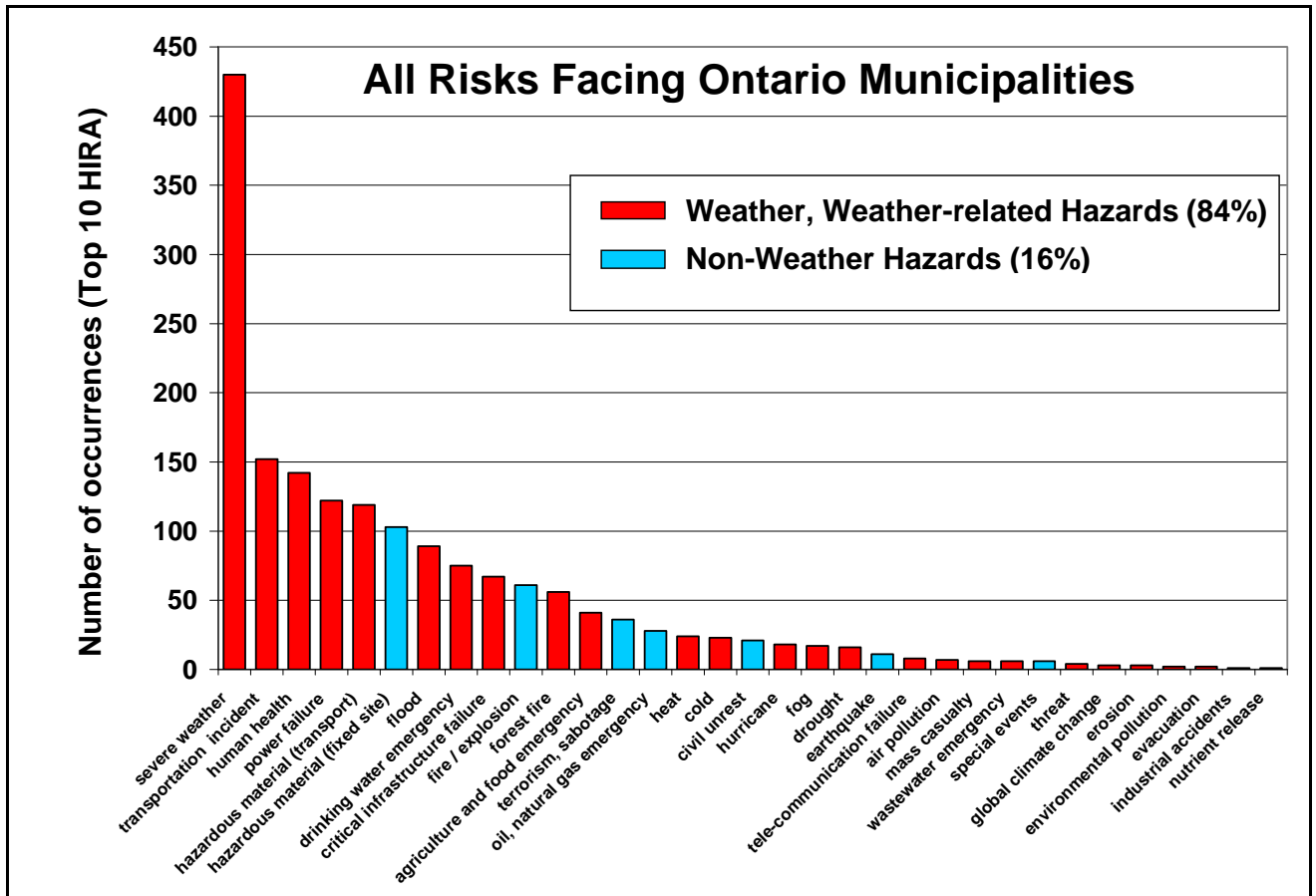


Figure 1: Summary rankings of all risks impacting Ontario Municipalities (Source: S. Butt and J. Klaassen, Environment Canada, 2009)

Figure 1 shows clearly that the majority of risks include weather or potentially weather-related hazards. Non-weather related hazards, such as earthquakes and civil unrest, are also summarized but only account for 16% of all risks facing municipalities. In most cases, they also tend to rank lower than the weather or weather-related hazards. Municipalities may not expect to be impacted by these events or they may not yet have taken these types of events into account.

Figure 2 identifies further details on all of the weather hazards identified by responding Municipalities. The results of the Municipal surveys were further subdivided into direct weather impacts versus potential indirect or weather-induced weather risks. Power outages are an example of a potential weather-related risk and it should be noted that outages were ranked high by most Municipalities. They can have a high impact on people and property, with significant disruptions to travel, business and services, particularly when the outages are extended. Transportation incidents (non-hazardous material) included all types of vehicle, air, rail and marine accidents, and these too can be linked to weather events (e.g. snow and ice storms, fog, windstorms).

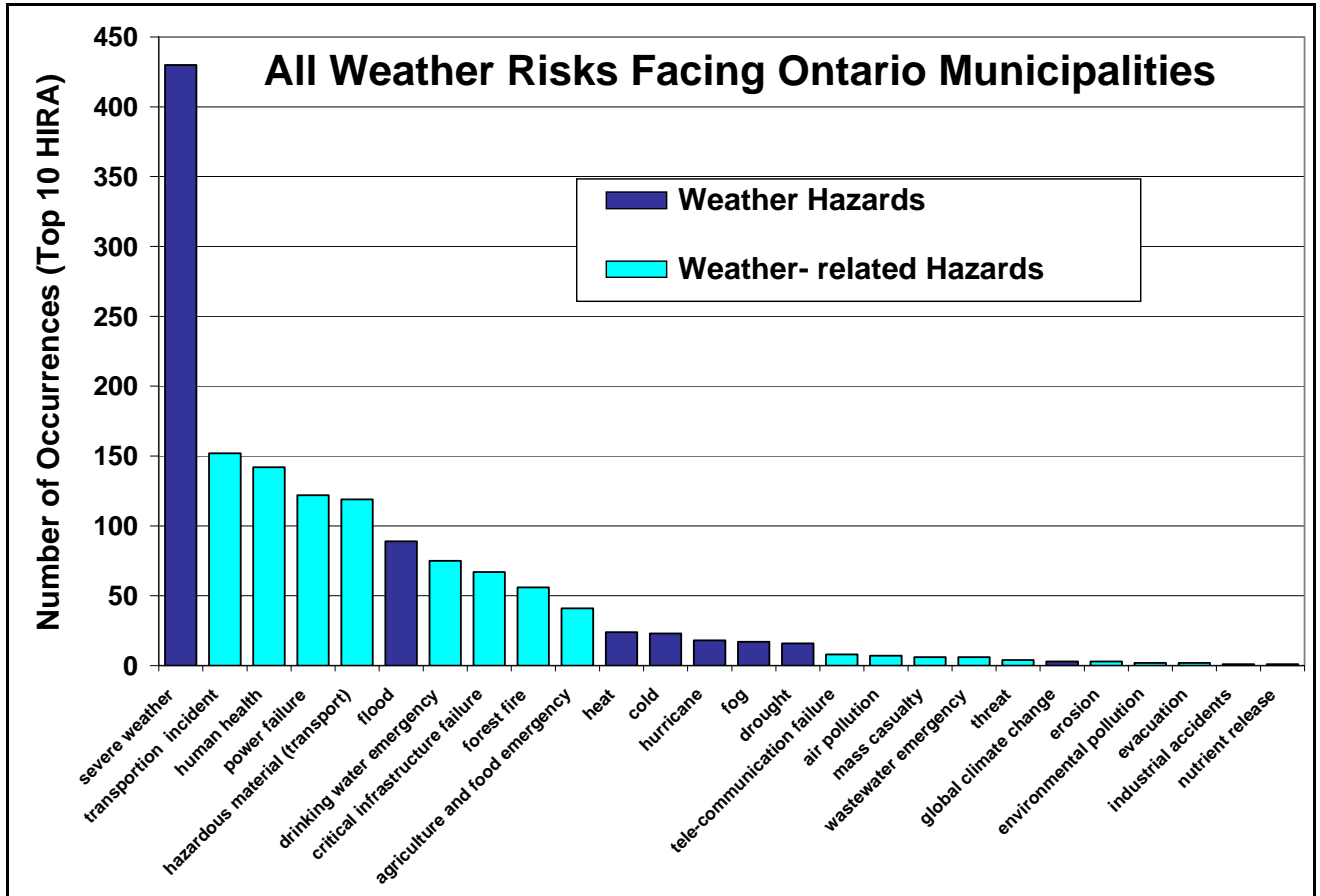


Figure 2: Summary rankings of direct impacts of weather versus indirect or weather-induced impacts on Ontario Municipalities. (Source: S. Butt and J. Klaassen, Environment Canada, 2009)

Summary Comments:

- 1) All hazards that result in high impact risks leading to emergencies and catastrophes are priority events – atmospheric hazards have been identified by Ontario municipalities as occurring more frequently and/or having higher impact than other hazards.
- 2) In 2003/04, many Ontario Municipalities and their staff had little preparation time before undergoing the HIRA training workshops to evaluate their respective hazards and then report their “top-ten” risks. Since the initial launch of Environment Canada’s hazards website in early 2004, new and updated atmospheric hazards information, including trends in extremes, have been added to the www.hazards.ca web site. A growing number of Municipalities have used this information to update their priority risk rankings; and Municipal “mock exercise” training sessions have also improved emergency preparedness in Ontario.

- 3) The recent survey conducted by Environment Canada and distributed by Emergency Management Ontario provides a useful province-wide summary of the priority risks to Ontario Municipalities, as illustrated in Figures 1 and 2. This information can benefit all Municipalities in evaluating their individual hazards rankings, emergency preparedness planning and policy development. At the same time, the summary rankings help identify future research needs to improve public safety and security.
- 4) It is worth noting, however, that these rankings are directly related to Municipal responsibilities in the event of emergencies. For example, drought, in many cases, is not commonly viewed as a direct Municipal responsibility and this likely factored into its lower ranking, despite the significant economic losses to crops, animals and property. (An additional factor that may have impacted drought's ranking is the fact that it is a "creeping" phenomenon where impacts build over time, unlike many other "immediate" severe weather events such as tornadoes or ice storms.)
- 5) The success of the initial atmospheric hazards work undertaken for Ontario has led to Environment Canada's ongoing expansion of the web site to all regions in Canada. The Canadian Atmospheric Hazards Network (CAHN) website is available at www.hazards.ca.
- 6) Under climate change, extreme weather events are likely to change in both frequency and/or severity. Future plans for Environment Canada's hazards website include provision of relevant climate change information to municipalities for assessing municipal risk to atmospheric hazards. This will complement climate change projections already available on Environment Canada's Climate Change Scenarios website: www.cccsn.ca

(Source: Don MacIver, Sadia Butt, Joan Klaassen, Heather Auld, 2009. Adaptation and Impacts Research Division, Environment Canada, Toronto, Ontario)