

Over one-third of the insured losses in Canada each year can be attributed to damaging thunderstorms—an average of \$320 million a year in insurance claims are due to hail, straight-line winds, and tornadoes. The RMS® Canada Severe Convective Storm Model incorporates an innovative blend of statistical and meteorological methods based on data specific to Canada in order to provide a more complete and accurate view of portfolio risk.

Canada Severe Convective Storm

The RMS Canada Severe Convective Storm Model covers a broad geographic area that encompasses the second most active region of severe convective storms in the world, with the Prairie Provinces and Ontario at greatest risk. Toronto and Calgary have each experienced multiple damaging hailstorms, amounting to insured losses in the hundreds of millions of dollars for each occurrence.

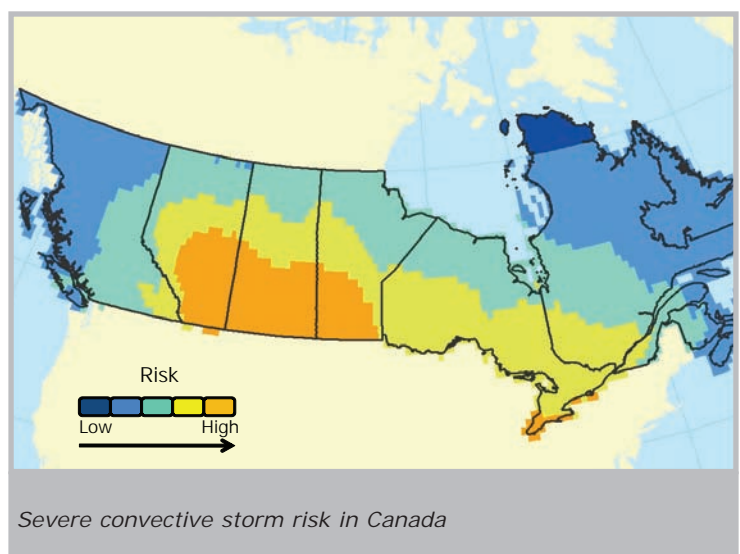
Severe convective storms can produce damage from large hailstones, powerful straight-line wind gusts, damaging lighting strikes, and deadly tornadoes. Convective outbreaks can range from the local development of a single thunderstorm to large multi-day, multi-province events that cause up to a billion dollars in insured losses.

Models that rely solely on historical catalogs of severe storm events can bias results in regions where catastrophes have been historically under or over-reported. Innovative modeling technologies ensure that the stochastic event set reflects the full variation in storm behavior across Canada, capturing the complex geographical distribution of wind and hail damage paths within each event.

CONTINUOUS STOCHASTIC EVENT SET MODELING

The RMS approach to stochastic event modeling incorporates innovative research to create a robust and comprehensive probabilistic event set, employing a hybrid methodology that combines the benefits of both statistical modeling and parameterization of the meteorological processes driving these events. This methodology allows for the incorporation of:

- High-frequency and low-frequency event sets
- The capture of non-catastrophic insured losses
- Realistic multi-day, multi-state, multi-peril events
- A large number of stochastic events that encompass insured loss from tornadoes, hailstorms, and straight-line winds



HIGH-RESOLUTION HAZARD MODELING

The damage patterns observed following an outbreak of severe convective storms are very complex and can be difficult to accurately assess. Storms can last several days and move across the entire continent, leaving hundreds of individual damage footprints. Historical footprints are typically constructed from damage reports that may include damage survey information if the event is severe.

To capture the detailed and complex nature of severe convective storm footprints, the Canada Severe Convective Storm Model incorporates weather observation data, historical damage surveys, and industry claims. Hail observation data and industry claims provide discrete point measurements that are useful for calibration and validation, but often fail to provide a comprehensive and continuous view of the hail storm footprint. To overcome the large spatial gaps in observational hail data, RMS has incorporated data from remote sensing into the construction of stochastic hail events. Radar data validated against surface observations and claims data was used to define the outbreak areas of individual hail swaths.

LOCATION-SPECIFIC VULNERABILITY MODELING

The vulnerability component of the Canada Severe Convective Storm Model features over 300 primary damage functions, including year built information, an important characteristic used to define a building's vulnerability. Vulnerability curves for tornado, hail, and straight-line winds were developed using industry claims, damage surveys, engineering models, and input from leading field damage survey engineers.



The Canada Severe Convective Storm Model assesses risk to residential, commercial, auto, and general industrial lines of business.

Model Specs

HISTORY

Original release 1995, complete upgrade in 2008

GEOGRAPHIC SCOPE

Canadian provinces below 60° North latitude

GEOCODING RESOLUTION

Latitude/longitude, street address, postal code, city, and CRESTA zone

LINES OF BUSINESS AND COVERAGES MODELED

21 residential, commercial, industrial, and auto lines occupancies; buildings, contents, and time element coverages are included