Damaging thunderstorms occur year round and can strike nearly anywhere in the U.S. and southern Canada. Storms range from localized, isolated hail and wind swaths to multi-day, multi-state events. In 2006, the U.S. alone sustained $8 billion in insured losses from multiple storms striking many states. The RMS® U.S. and Canada Severe Convective Storm models incorporate an innovative blend of statistical and meteorological methods to provide a more complete and accurate view of portfolio risk.

U.S. and Canada Severe Convective Storm

The RMS® U.S. and Canada Severe Convective Storm models cover a broad geographic area that encompasses the most active region of severe convective storms in the world, with the Midwest and Great Plains regions of the U.S. and the Prairie Provinces and Ontario in Canada at greatest risk. 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-state events that cause billions 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 U.S. and 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:

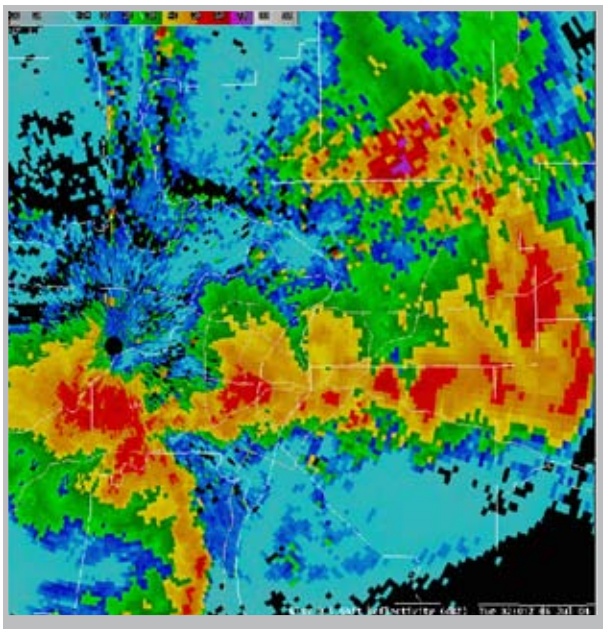
- High-frequency and low-frequency event sets
- The capture of non-catastrophic insured losses
- Realistic multi-day, multi-state, multi-peril events
- A large number of stochastic events that encompass insured loss from tornadoes, hailstorms, and straight-line winds

Damage to a residential structure from an F5 tornado that struck Greenburg, Kansas in May 2007

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 to thousands 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 U.S and Canada Severe Convective Storm models incorporate 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.



Radar interpretation is used to enhance the accuracy of stochastic hail events

Location-Specific Vulnerability Modeling

The vulnerability component of the U.S. and Canada Severe Convective Storm Models 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.

Model Specs

History

Original release 1995, complete upgrade in 2008

Geographic Scope

United States, excluding Alaska and Hawaii;
Canadian provinces below 60° North latitude

Geocoding Resolution

Latitude/longitude, street address, postal code, and city, plus county in the U.S. and CRESTA zone in Canada

Lines of Business and Coverages Modeled

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

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