

When All Hail Breaks Loose

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When hail occurs, losses amass and adjusters go to work determining the extent of damage and the coverage afforded to the property owner under their policy. Often the claim settlement is complicated by pre-existing conditions, prior hail events, availability of accurate hail verification data, and “neighboritis” syndrome (i.e. my neighbors insurance carrier replaced their roof, etc.). To understand the issues surrounding validation of hail claims, Weather Decision Technologies, Inc. (WDT), a Norman, Oklahoma-based weather company, conducted a survey of claims professionals to determine current methodologies and needs for future development of hail verification tools.

Over 3,500 claims professionals were invited to participate and 223 completed an on-line Internet survey. The survey participants represent insurance carriers (87%), independent adjusting firms (9%), and engineering firms, law firms, or other third party administrators (4%), involved in the processing and evaluation of hail claims. The majority of respondents are involved with both personal and commercial lines and 30% are claims supervisors, managers or executive level claims personnel. In addition, thirty-nine percent of the participants handle 60 or more hail claims in an average year.

The survey confirmed a key WDT hypothesis that on-site evaluations are the preferred verification methodology. A total of 84% of those surveyed indicated they “always” (63%) or “usually” (21%) conduct an on-site investigation. Less than 4% indicated they “rarely” or “do not” conduct an on-site investigation.

When queried regarding other resources used to validate hail losses - specifically excluding on-site investigations - the majority of those surveyed indicated they use weather reports. While the majority of the survey respondents use these reports as an instrumental part of the hail claim investigation, no single weather information resource was selected by more than 15% of the respondents. The weather resource choices included commercial weather companies, the National Climatic Data Center (NCDC), local National Weather Service offices, Storm Data (publication issued by NOAA/NWS), the Internet and various other sources. The Property Loss Research Bureau (PLRB) and Property Claim Service (PCS) were the most commonly mentioned by the respondents as “other” resources (write in answer) utilized to access hail data.

A possible reason than no single source is the preferred provider of hail data, is that there are many end-sources to access this information, including government, non-profit and commercial companies. But where do they obtain their data? In general, collection of hail data in the United States originates with the National Weather Service (NWS). The primary input to this collection of data is human observations, which are submitted by NWS meteorologists, trained weather spotters and ordinary citizens who phone their local

NWS office to report the location, date, time and estimated size of hailstone. The hail data are then provided to consumers via the National Climatic Data Center (NCDC) and the Storm Prediction Center (SPC). Finally, this information is repackaged by the other entities which distribute hail data.

Many commercial weather companies augment the NWS human observation data by review of a meteorologist, who adds his/her professional opinion regarding the likelihood of hail activity at a particular site, based on the surrounding weather data and knowledge of storm activity.

Ideally to validate hail, an educated observer would be present at every loss site during the hail event to document the presence and size of the hailstone. Unfortunately this is an unattainable goal. From a weather data perspective; however, there are several recent developments that will enhance hail verification – not make it perfect – but help to substantiate hail activity and estimated hailstone size and location, regardless of human observation. Beginning in January 2001, the National Weather Service enabled easier and more open access to NEXRAD Radar level II and III data, a significant opportunity to utilize this robust dataset to evaluate hail fall activity.

The NWS, the Federal Aviation Administration and the Department of Defense, have deployed a network of 144 state-of-the-art Next-generation Doppler weather radars (called NEXRAD) throughout the Continental United States. NEXRAD sites collect data continuously and can provide full 3-D coverage of their local region every 5 minutes. In addition, the NEXRAD has a number of computer algorithms, developed by scientists at the National Severe Storms Laboratory (NSSL), that automatically detect severe weather phenomena. One of those algorithms is the Hail Detection Algorithm (HDA) which identifies those storms that are most likely to produce hail. In addition, the HDA provides an indication of the size of hail presently being produced by a storm.

Studies have shown that the HDA is skillful in determining whether a given storm will produce hail. One study performed in Colorado showed the HDA correctly determined which storm was producing hail 92% of the time with an extremely low false alarm ratio of 4 %; (Witt et. al. 1998). Also, based upon a geographically diverse radar dataset, the HDA has demonstrated very accurate detections of severe hail including the probability of detecting hail greater than 1 inch (87%) and 2 inches (96%). These accuracy numbers reflect the use of only one radar to detect hail.

Based on the need identified in the survey, WDT scientists have now created a proprietary enhancement to the algorithm and a commercially available hail report, which incorporates the human observation data, NEXRAD data, and WDT's HailSwath Prediction Algorithm (HPA). HPA is capable of utilizing overlapping data from multiple NEXRAD sites that cover the area of interest. This allows for increased reliability to detect hail over the lifetime of hail generating storms. It is important to emphasize that performance is a function of atmospheric conditions, proper operation and calibration of the radar and quality reports of hail; however, used in conjunction with on-site

investigations, these types of reports can significantly enhance the adjusters knowledge of what likely happened at the loss site.

When discussing hail in the insurance community, it is almost impossible to do so without including roofs in the conversation, since a significant portion of hail claims are damage to roofs or related structures (siding, gutters, flashing, etc.). In the WDT survey, 81% indicated that one-half or more of all the hail losses they adjust are roofing-related losses.

Haag Engineering Company, a Dallas-headquartered engineering firm has been evaluating roofing losses since 1924 and has assessed more than 10,000 roofs in the past ten years. In the overwhelming majority of these evaluations, a determination of hail damage was the purpose for the review. What are engineers, adjusters and other investigators looking for when distinguishing naturally occurring hail from deliberately inflicted mechanical damage? Naturally occurring hail damage to roofs or any other structure is going to vary in size, shape and depth of the impact site, due to the randomness of hailstone dimension, shape and density. Further, the density and condition of the impacted material adds to the resulting damage or lack thereof.

Most hail related damage is cosmetic and does not affect the useful life of roof shingles. When the velocity is sufficient and hail strikes wood shingles and shakes, damage is sustained when the hail impact is great enough to break the wood and thereby compromise one ply of the roofing and leaving two narrow shingles (or shakes) secured with only a single fastener. Built-up roofs (most typical felt and coated materials) are damaged when the impact of the hailstone fractures the membrane of the material, which compromises its ability to keep moisture out of the lower levels of the structure.

The physical dynamics of wind-driven hail producing storms are likely to cause more damage to windward exposed locations than leeward exposed locations. Damage to sloped roofs facing in different directions can vary significantly if the hail is wind-driven. The same scenario occurs when losses are to automobiles and other property. Damage may be heaviest on the horizontal and windward sides, while other areas will have relatively little or no damage.

Often the indicators which do not support natural hail, are even distribution of events and consistent size and shape of the impact sites. Additionally, damage to a roof with a lack of impact sites on metal vents, flashing or HVAC equipment can be indicative that the damage was not caused by hail.

In recent years, roof shingle manufacturers have been listing products that conform to Underwriters Laboratories test standard UL 2218, which classifies the resistance of a particular product to hail damage. The standard, released in May 1996, tests roofing materials that are classified to the test method using the free-falling steel balls and ranks in classes of ascending order, Classes 1 through 4, where Class 1 has the least resistance to impact. Many insurance companies offer cost-saving programs to homeowners installing UL2218 Class 4 rated products. Several industry studies are underway to

analyze the financial cost-benefit, for the property owner and the carrier, of using hail resistant roofing materials. While some financial benefit is certain, more years of installed history will help to understand the long-term benefits from these products.

Hail damage in the United States costs the insurance industry over a billion dollars annual and while there is no end in sight, claims professionals will continue their quest of accurate hail assessments, using on-site investigations augment with weather reports, and looking for building code changes and other necessary long-term efforts to reduce hail losses.

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