

# THE PROTECTOR

A QUARTERLY PROPERTY LOSS CONTROL NEWSLETTER

ISSUE FOUR

Q1 2021

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## ALL ABOUT HAIL

### HOW IT FORMS, FALLS, AND DAMAGES



**The familiar pounding of hail on our roofs and windows often beckons us to investigate what the day's weather is producing. While hail is often harmless it can also cause significant damage to equipment, buildings, and vehicles, and can even be deadly. For this fact – it is important to familiarize yourself with hail, the conditions that create it, and what you can do to mitigate damage.**

#### HOW IT FORMS

Hailstones are formed when raindrops are carried upward by thunderstorm updrafts into extremely cold areas of the atmosphere and freeze. Hailstones then grow by colliding with liquid water drops that freeze onto the hailstone's surface. If the water freezes instantaneously when colliding with the hailstone, cloudy ice will form as air bubbles will be trapped in the newly formed ice. However, if the water freezes slowly, the air bubbles can escape and the new ice will be clear. The hail falls when the thunderstorm's updraft can no longer support the weight of the hailstone, which can occur if the stone becomes large enough or the updraft weakens.

Hailstones can have layers of clear and cloudy ice if the hailstone encounters different temperature and liquid water content conditions in the thunderstorm. The conditions experienced by the hailstone can change as it passes horizontally across or near an updraft. The layers, however, do not occur simply due to the hailstone going through up and down cycles inside a thunderstorm. The winds inside a

thunderstorm aren't simply up and down; horizontal winds exist from either a rotating updraft, like in supercell thunderstorms, or from the surrounding environment's horizontal winds. Hailstones also do not grow from being lofted to the top of the thunderstorm. At very high altitudes, the air is cold enough that all liquid water will have frozen into ice, and hailstones need liquid water to grow to an appreciable size.

#### HOW IT FALLS

Hail falls when it becomes heavy enough to overcome the strength of the thunderstorm updraft and is pulled toward the earth by gravity. Smaller hailstones can be blown away from the updraft by horizontal winds, so larger hail typically falls closer to the updraft than smaller hail. If the winds near the surface are strong enough, hail can fall at an angle or even nearly sideways! Wind-driven hail can destroy building materials, break side windows on vehicles, and cause severe injury and/or death.

The fall speed of hail primarily depends on the size of the hailstone, the friction between the hailstone and surrounding air, the local wind conditions (both horizontal and vertical), and the degree of melting of the hailstone. Early research assumed that hailstones fell like solid ice spheres and showed very high fall speeds, even for very small hailstones. However, recent research has repeatedly shown that natural hailstones fall more slowly than solid ice spheres. For small hailstones, <1" in diameter, the

## HAILSTORMS IN WISCONSIN

WHERE MINUTES EQUAL  
MILLIONSWEDNESDAY, FEBRUARY 24<sup>TH</sup>  
10:00 A.M. - 11:00 A.M.

REGISTER NOW

FAIR SKIES  
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County  
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Wisconsin County Mutual Insurance Corporation

COMMUNITY  
INSURANCE  
CORPORATION

#### ABOUT THE COUNTY MUTUAL

The Wisconsin County Mutual Insurance Corporation (County Mutual) provides public entity liability, workers' compensation, and property insurance solely to Wisconsin counties.

#### ABOUT COMMUNITY INSURANCE CORPORATION

Community Insurance Corporation (CIC) provides liability, workers' compensation, and property insurance to Wisconsin school districts and local units of government.

ALL ABOUT HAIL / CONTINUED ON PAGE 5

# CHIEF'S CORNER



## CHIEF JOSEPH FORRO MILWAUKEE COUNTY FIRE DEPARTMENT



The **MILWAUKEE COUNTY FIRE DEPARTMENT (MCFD)** serves the passengers, visitors, guests, and employees of the Milwaukee Mitchell International Airport in Milwaukee, Wisconsin. We provide FAA-required Aircraft Rescue and Fire Fighting (ARFF) services. The MCFD consists of 23 full-time members, including one Fire Chief, four Assistant Chiefs, three Shift Captains, and 15 Firefighters. We operate under the direction of MKE Airport leadership.

The MCFD responds to nearly 1,000 calls for service per year. The vast majority of these are on Airport property; 83% are for medical emergencies within the terminal. MCFD also responds to aircraft emergencies and vehicle accidents in the vicinity of Milwaukee Mitchell International Airport. One Fire Station is strategically located near the middle of the airfield, close to the intersection of MMIA's two longest runways. MCFD is also a fully participating MABAS Division 107 (Mutual Aid Box Alarm System), which allows our MABAS partners to call upon our unique firefighting application devices.

Aircraft Rescue and Firefighting (ARFF) is a very specialized form of firefighting. In addition to basic firefighting knowledge, Milwaukee County Airport Firefighters must remain proficient in all aspects of aircraft construction and hazard identification. Each service that we provide has specific training requirements. For instance, ARFF involves 40 hours of training on 12 specific topics and two live fire burns annually. In addition to this training, our firefighters are licensed EMTs which adds another layer to our training demands. Our EMTs must participate in Continuing Education Units (CEU) throughout the year and attend a week-long refresher course to maintain their licensure. We are fortunate to have a very robust training facility that includes a "Class A" burn tower, an aircraft mock-up for live-fire burns, as well as a classroom for up to 20 students. These assets ensure that our customers are provided with the very best service possible.

MCFD personnel is also tasked with oversight of the airport refueling system. This involves quarterly inspections of fuel delivery equipment such as tank trucks, hydrant trucks, fuel storage facilities, and training personnel performing aircraft refueling.

As previously stated, we are an all-hazards response agency which means that we must be prepared to handle many emer-



gencies, sometimes all at once. Weather- and weather-related emergencies can put a hefty tax on our resources. As we saw early in the spring of 2020, when several storms barreled through southeastern Wisconsin, our airport found itself in the crosshairs. We took a direct hit by one of the storms with straight-line winds above 80 mph. During this event, several aircraft were "repositioned" by the winds to include a Boeing 727 that MCFD uses for training. This aircraft was blown a full 90 degrees from its original parking location. We had multiple calls for service ranging from personnel hit with flying debris to fire alarm activations from power bumps. Thankfully, there were no serious injuries or property lost at the end of the day, nor were there any significant flight delays keeping our customer's travel plans intact.

Living in Wisconsin, we find ourselves faced with all manner of weather phenomenon, from winter storms that can drop "feet" of snow, spring storms spawning tornados, and the heavy downpours of our early summer evenings. We must always keep an eye on the weather when conditions call for it, and if you are planning to be in an area where you may find yourself "in the elements," ensure you are prepared:

- Always carry warm blankets in your car
- Keep the gas tank above ½ a tank
- Make sure if you are traveling, someone knows your plan.

**Taking these seemingly small steps can save your life!** 

## THE PROTECTOR

# WHAT DO YOU NEED TO KNOW



## MY ROOF IS DAMAGED BY HAIL OR WIND WHAT DO I DO NOW?

Hail and wind damage can occur without warning – and can leave behind little evidence. Following severe weather events, it's important to inspect your buildings – especially roofs – for any resulting damage. Below is a guidemap you can use following a hail or wind event.

1. The damage event occurs.
2. Utilize internal staff to complete an immediate assessment of the damage. Determine if the damages are estimated to exceed 50% of your property insurance deductible.
3. If the estimated damages exceed 50% of your property insurance deductible, immediately **report a claim to your property insurance adjuster and take steps to mitigate damages (Stop the Bleed! Make the location Safe!).**

We recommend partnering with a disaster restoration contractor for large-scale mitigation work and loss scenarios where water penetration exists to the interior of the building. Mold can form within 24 hours of a loss. DRY OUT and DISINFECT the AREA! Professional restoration contractors have the expertise to completely mitigate the damage and find any and all hidden moisture. You don't want a small issue to turn into a large problem.

4. Document the loss through pictures, written statements, and oral conversations. The documentation supports the loss and is useful for determination of cause and origin.
5. Now, the loss is under control and future damages are mitigated, contact a roofing contractor to generate a scope of

work for completion of like kind and quality repairs to the roof. The scope of work must include an itemized estimate of the costs associated with the roof repairs. At the same time, the property insurance adjuster may hire his or her own roofing contractor to develop a scope of work and cost estimate to compare to your scope of work and cost estimate.

6. Once the scope of work and associated cost estimate are obtained, submit them to the property insurance adjuster for review. The property insurance adjuster reviews the scope of work and cost estimate, making a comparison between your documents and documents obtained by the property insurance adjuster's roofing contractor.
7. The property insurance adjuster will collaborate with you to navigate any differences in the scope of work and cost estimates.

**Remember, insurance is indemnification, not betterment. In most cases, your property is valued at Replacement Cost; i.e., cost of replacing lost or damaged property with new property of like kind and quality, or its functional equivalent, at current prices.**

8. The property insurance adjuster approves the scope of work and estimated cost.
  - If multiple bids/cost estimates are required, you obtain the bids/cost estimates based upon the agreed scope of work.
  - Once the bids/cost estimates are received, the property insurance adjuster will review them and collaborate with you to navigate any differences and agree on the cost of repairs.
9. You hire a contractor to complete the repair work.

**Full roof replacements require you to mandate that the roofing contractor provides a written warranty. The warranty may require inspection by the manufacturer to certify the quality of the installation and that proper materials were utilized.**

10. All invoices are submitted to the property insurance adjuster.
11. The property insurance adjuster reviews the invoices and includes all agreed costs in claim settlement and requests a signed proof of loss from you.
12. The proof of loss is signed and returned to the property insurance adjuster.
13. The property insurance adjuster issues a reimbursement check and closes the claim.

**WHAT DO I DO NOW? / CONTINUED ON PAGE 5**

*This material does not amend, alter, or otherwise affect, the provisions or coverages of any insurance policy or bond issued by WCMIC or CIC, nor is it a representation of coverage that does or does not exist for any particular claim, loss or dispute under any such policy or bond. Coverage depends on the facts and circumstances involved in the claim, loss, or dispute, all applicable policy or bond provisions, and any applicable law.*

# THE PROTECTOR

## LESSONS LEARNED:

### HAIL...HAIL...THE BANG'S ALL HERE - HAIL DAMAGE & PREVENTION



#### What is Hail?

Hail is solid precipitation that can occur in conjunction with any strong thunderstorm. It is caused by updrafts in the thunderstorm, where particles freeze in the upper atmosphere and grow as layers are added before falling. Hailstones can range from a fraction of an inch to 3 inches or more, or in the vernacular of hail, from "pea-sized" to "softball-sized."

#### When is Hail most likely in Wisconsin?

Historically, hail season runs from March through October and peaks in June and July.

#### Ouch - that will leave a mark!

The wind speed will enhance the damage that is caused by hail. For example, hail being blown by a 70 mph wind can do more harm than hail falling in light wind. In a severe storm situation, the hail size can often be greater than 1" combined with harsh winds. This type of situation can cause severe damage from hail.

For sturdy buildings, small hail is unlikely to do much damage. The magnitude of damage tends to be much less with the small hail when it comes to buildings and structures. Once hail gets over one inch, then the damage to cars, windows, roofs, and structures increases significantly. The force impact of hail goes up exponentially with hail size. For example, 1.5-inch hail will not just do twice as much damage as 0.75-inch hail; it can do many times more the damage.

#### Damage & Prevention

1. In addition to roofs, windows and siding also can be damaged by severe hail. Because large hailstones can shatter windows, closing drapes, blinds, or window shades during a severe hailstorm can help keep the wind from blowing broken glass inside.
2. Skylights also are vulnerable, particularly as they degrade over time. Weather and aging can accelerate the deterioration of non-impact-rated skylights and make them brittle, increasing their vulnerability to cracking, leakage, and shattering from hail.

Select impact-rated skylights that meet FM Approval Standard 4431 or ASTM E1996 Large Missile Impact Rating. The impact resistance of the glazing material in a skylight may not be equal to large hailstones' impact energy. Adding a protective cover over the skylight may be the solution.

3. Extensive hail damage also has occurred to outdoor roof- and ground-mounted equipment, particularly unprotect- ed metal surfaces and condenser coils, which can bend or break. This can result in extensive cosmetic damage and cause the equipment to shut down or malfunction. It is essential to have outdoor equipment such as A/C units, backup generators, electrical equipment, and storage tanks visually inspected promptly to determine the severity of damage and whether it can be repaired or needs to be replaced.

4. Look for impact-resistant products and materials rated as "Severe Hail" or "Class 4" when constructing a new build- ing or replacing a roof. (Learn about IBHS' research find- ings on the relative impact resistance of asphalt shingles at: [www.DisasterSafety.org/ibhs/asphalt-shingles-relative-impact-resistance-report](http://www.DisasterSafety.org/ibhs/asphalt-shingles-relative-impact-resistance-report).)

5. Choose equipment capable of withstanding hail impacts or install protection such as hail guards, shields, or wire mesh to reduce hail impact damage to outdoor roof and ground-mounted equipment. As with any roof-related in- stallations, the hail guard or shield should also be appro- priately designed to resist estimated wind uplift pressures as defined by ASCE 7.

#### Do A/C unit hail guards work? Yes! Are they worth it? Yes!

At about \$250-\$350 each, manufacturer-installed hail guards are a surprisingly inexpensive fix that won't compromise the unit's efficiency.

The average cost to fix a condenser coil is \$500, but replacing a coil can run at least \$500 per ton of cooling, a measurement of air conditioning capacity that refers to the amount of heat needed to melt a ton of ice over 24 hours. As one ton of cooling typically covers about 250 square feet of interior space, re- placement costs can quickly add up.

Replacing an entire AC unit can run more than \$1,000 per ton of cooling. In a 250,000 square foot property, the replacement could easily reach \$1 million.

For 200-ton to 500-ton air conditioning units, it could take three to four months to build and install a new unit, with roof modifica- tions sometimes necessary during the repair process. 

# THE PROTECTOR

## ALL ABOUT HAIL

CONTINUED

expected fall speed is between 9 - 25 mph. For hailstones that one would typically see in a severe thunderstorm, 1" -1.75" in diameter, the expected fall speed is between 25 - 40 mph. In the strongest supercells that produce some of the largest hail one might expect to see, 2" - 4" in diameter, the expected fall speed is between 44 - 72 mph. However, there is much uncertainty in these estimates due to variability in the hailstone's shape, degree of melting, fall orientation, and the environmental conditions. However, it is possible for very large hailstones, diameters exceeding 4", to fall at over 100 mph.

When viewed from the air, it is evident that hail falls in paths known as hail swaths. These occur as storms move while the hail is falling out. They can range in size from a few acres to an area 10 miles wide and 100 miles long.

## HOW IT CAUSES DAMAGE

In 2019, over 7.1 million US properties were affected by hail damage while 2017 saw 10.7 million damaged properties. In 2016, over 12.6 million US properties were affected by hail damage and 2013 had only 8.1 million properties affected. As you can see, the severity of hailstorms vary greatly from year to year.

Although Florida has the most thunderstorms, Nebraska, Colorado, and Wyoming usually have the most hailstorms. The area where these three states meet – "hail alley" – averages seven to nine hail days per year. Other parts of the world that have damaging hailstorms include China, Russia, India and northern Italy.

The largest hailstone recovered in the United States fell in Vivian, South Dakota, on June 23, 2010, with a diameter of 8" and a circumference of 18.62". It weighed 1 lb. 15 oz. Some storms, instead of producing large hail, instead produce copious amounts of small hail. Storms like these have produced hail drifts that, when captured in clogged drainage channels, formed piles of hail several feet deep. Hail that completely covers roadways is especially hazardous because if deep enough, a vehicle's tires may not touch the roadway at all, with the vehicle instead driving on the hail, which acts exactly like an icy roadway in the winter.

Because of hail's dependence on sporadic conditions to form, it is important that your organization establishes a clear process for monitoring severe weather in order to proactively mitigate losses to your property and protect the safety of your employees.

Want to receive *The Protector* and other important risk management notifications? Contact Josh Dirkse at [josh@aegis-wi.com](mailto:josh@aegis-wi.com) or 800.236.6885



Wisconsin County Mutual Insurance Corporation



## WHAT DO I DO NOW?

CONTINUED

The County Mutual/CIC have a strategic partnership with Kelmann Restoration for disaster restoration services. Kelmann Restoration can be contacted at 414-774-3799 (be sure to note "Insured through County Mutual and/or CIC"). Disaster restoration contractors provide 24/7 - 365 emergency response and mitigation services. These contractors have the capabilities, tools/equipment, and experience to stop further damage.



## WHEN DISASTER STRIKES,

# WISCONSIN COUNTS ON KELMANN.

Kelmann Restoration is Wisconsin's family-owned and nationally-recognized property damage restoration company. When it comes to protecting our counties, cities, towns, school districts and families, we are the most resourceful and trusted emergency service provider in the state. Our industry-leading teams act quickly to get you back to "normal," keeping communication, safety and environmental precautions as our top priorities.

**kelmann**  
RESTORATION

Learn more about us and see photos of our work:  
[kelmann.com](http://kelmann.com) | 414.774.3799

# BE PREPARED, NOT SCARED

SOUNDS CLICHE TILL YOU NEED TO BE



EXPERT WITNESS



HAZARD PLANNING



WEATHER ANALYSIS

## MARK MCGINNIS

CERTIFIED CONSULTING METEOROLOGIST  
[MMCINNIS@FAIRSKIESCONSULTING.COM](mailto:MMCINNIS@FAIRSKIESCONSULTING.COM)



[WWW.FAIRSKIESCONSULTING.COM](http://WWW.FAIRSKIESCONSULTING.COM)

# PROPERTY SCHOOL



## HAILSTORMS IN WISCONSIN WHERE MINUTES EQUAL MILLIONS

WEDNESDAY, FEBRUARY 24, 2021  
10:00 A.M. – 11:00 A.M.



Mark McGinnis has forecast winter weather for over 25 years. Over the last five years, Mark has provided expert reports and analysis on hail and other damaging storms that have ended up in court cases, not only in Wisconsin, but across the United States.

**Join us to discuss:**

- ※ How hail develops and when it is most likely to occur in Wisconsin;
- ※ The impact of hail on your operations and employee safety;
- ※ How to lower your risk and mitigate damage.

**Hail requires many conditions and factors to accumulate – having a better understanding of hailstorms in Wisconsin will help you avoid significant damage to your property and help protect your employees.**

### WEBINAR DETAILS

**Date:** Wednesday, February 24, 2021  
**Time:** 10:00 AM to 11:00 AM  
**Cost:** NO COST

### ABOUT FAIR SKIES CONSULTING

Founded in 2013, Fair Skies Consulting, LLC helps companies, communities, and clients better understand their risk to specific weather variables and how to mitigate risk – and turn some risk into opportunity. Founder Mark McGinnis has over 25 years of meteorological and communications experience. He holds multiple certification from the American Meteorological Society (AMS) and is the Chairman of its Board of Certified Consulting Meteorologists.

**REGISTER NOW**

The Property School is an ongoing program to support Facilities/Building Management personnel and provide education aimed at preventing and mitigating losses. Topics such as programmed maintenance, emerging building techniques/materials, inspection tools and procedures, and guidelines for repair and general maintenance. The Property School is administered in association with our strategic partners.