Why Event Organizers Need A Comprehensive Weather Safety Plan

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Keeping an eye on the weather isn't enough to keep attendees safe

Hundreds of thousands of outdoor events occur across the world each year — ranging in size from large sporting events, outdoor festivals and concerts to smaller events taking place at a local park or youth athletic field. While the spectators of these events will be focused on their sports team, favorite entertainer, or their child — who is keeping an eye on the inclement weather on the horizon? Public safety should be the top priority of event managers and organizers, as nearly all outdoor events will be subject to the potential threat of adverse weather conditions. Event organizers equipped with a comprehensive weather-related safety plan, a monitor of real-time weather information, and accurate weather information can mitigate risk.

According to the National Oceanic and Atmospheric Administration (NOAA), lightning strikes the United States approximately 25 million times a year, with these bolts being able to travel more than 10 miles away from the rain shaft. From 2006-2019, 418 people have been struck and killed by lightning in the United States — with over 60% of these fatalities occurring as these individuals participated in outdoor leisure activities. Besides lightning, the approximately 100,000 thunderstorms that develop across the United States each year may also be occasionally accompanied by damaging winds, torrential rain, large hail, and tornadoes. While NOAA advises, "when thunder roars, go indoors!" for large venues or outdoor gatherings, the first rumble of thunder or raindrops may already be too late to successfully shelter or evacuate your patrons.



When safety plans fail

In July of 2018, a Ride the Ducks vehicle sank on Table Rock Lake in Missouri 35 minutes after leaving the dock killing 17 people. The duck boat was seen taking on water in large waves during a severe thunderstorm with 65 mph winds. This tragedy could have been avoided if the boat operators had heeded the severe thunderstorm warnings issued by the National Weather Service. Investigators interviewed the duck boat captain the day after the accident. He said he took the boat into the water because a weather radar indicated the storm was far away, but it quickly turned from calm to turbulent. The operating company of the now defunct Ride the Ducks of Branson has settled 31 lawsuits filed by survivors or relatives of those who died.

On August 2, 2015, workers at the Wood Dale Prairie Fest in Chicago took precautions, such as shutting down the carnival rides out ahead of the approaching storm, but no other steps were taken from a pre-crafted weather-related safety plan to mitigate risks for festivalgoers. When the storm and accompanying strong winds hit, instead of following the safety plan that directed patrons from the festival grounds to the nearby junior high school, the guests were tragically sent to take cover under the festival tents. The organizers struggled to find a course of action as the storm bared down, with no apparent structure of how to formally announce or enact their evacuation plan. Wood Dale police Chief Greg Vesta recalled, "Within a couple minutes it went from nothing to high winds, heavy rain, and hail." Relatives of one who died and another 16 who were injured have filed lawsuits against the event organizers and companies that provided and set-up the tents for the Wood Dale Prairie Fest.

Developing a comprehensive weather-related safety plan

Weather tragedies at outdoor events pay out millions of dollars in damages from litigation and receive high-visibility media headlines. Many large venues or gatherings have successfully averted these weather disasters by staffing an operations team, that includes a safety manager/director who proactively develops a comprehensive weather-related safety plan. Over the last several years, the National Center for Spectator Sports Safety and Security, NCAA, and the Event Safety Alliance have developed guidelines and resources to help venues be better prepared. Under these guidelines, weather monitoring, evacuation plans, and mass communication are some of the topics addressed to provide better public safety.

When developing a weather evacuation plan, stadiums, festivals, and golf tournaments provide unique challenges and are all different. The availability (if any) of safe indoor shelters, differing venue sizes, and the layout of the event, including busing and parking lots, will all affect the time that is required to evacuate spectators to safety — sometimes in excess of an hour. Golf tournaments or large outdoor festivals, for instance, are usually more widespread, covering several miles which requires additional time for patrons to seek shelter.

A venue may only have one main entrance/exit which could become a "choke" point if people are having to wait to board shuttle buses to return to the parking lots or seek shelter. Exacerbating this problem, a 20-minute or longer shuttle ride to the parking lot or designated shelter spot could expose spectators to the elements they are trying to avoid. On the other hand, a stadium or similar venue may have over 80,000 spectators in attendance but can be evacuated in a timelier manner due to the presence of many exits, parking on-site, or nearby fully enclosed buildings. Once these factors have been considered, a well thought-out evacuation plan for various adverse weather conditions can be adopted and should be practiced several times leading up to the event.

As inclement weather approaches, communicating the threat to your staff and spectators is key. Effective action plans require a pre-determined decision-making hierarchy. Utilizing a decision tree with specific threat-based trigger points will aid in the communication and messaging process. Consider proactively running weather policies across scoreboards and information boards to keep the public informed. Many venues can also make announcements over a PA system — quickly informing the public of when to evacuate the venue and provide them with necessary information to direct them to the nearest exit or safe shelter. Once the weather hazard has departed, announcements can be made to orderly reopen the venue. Push notifications through applications, social media, or mass distribution of text messages on mobile phones can also be a very effect way to communicate potential threats, suspensions, evacuations, and resumption details.



Recent success

One of the recent success stories at a large venue occurred at the University of Notre Dame. The university transformed its open-air stadium into a concert venue for the first time in October 2018 as Garth Brooks and his band entertained some 85,000 fans, despite worsening weather conditions. A strong low-pressure system settled over the stadium and brought strong winds gusting between 30-50 mph, heavy rains, and even small hail. With stage lighting and audio equipment hanging high above the stage, the safety of participants, crews, and the expected attendees was of great concern.

Utilizing a weather service with modern decision support tools, which included having an on-site meteorologist, concert officials were able to take necessary precautions to lower the scaffolding that held the lighting and audio equipment. With the forecast predicting heavy rain and the possibility of small hail, officials decided to postpone the 7 p.m. start of the concert by one hour. At 7:45 p.m., the on-site meteorologist notified officials that the rain and winds were expected to die down at 8 p.m., allowing Garth Brooks and his band to take the stage and successfully perform their show.

Another success story took place on August 2, 2015 — across town from the fated Wood Dale Prairie Fest. Concert attendees were briefly evacuated at Lollapalooza when severe thunderstorms rolled across northern Illinois and the Chicago area. Organizers directed fans to evacuate the festival grounds and take shelter in three pre-designated parking decks at around 2:30 p.m. when severe thunderstorm warnings were issued by the National Weather Service. Consulting with a private weather service that was remotely monitoring the area, event managers were informed well ahead of the arrival of severe thunderstorms and able to confidently execute their evacuation plan — keeping 300,000 people safe and resuming the concerts at around 4 p.m.

Utilizing the best real-time weather information

Weather information can come in many forms, including free or basic mobile applications, or even local TV. However, the use of some of this information will likely be delayed and inadequate to make confident, informed decisions. Larger venues should consider utilizing the services of a professional weather company to help them prepare. Many of these professional weather services provide PC and mobile weather applications, including online services with state-of-the-art alerting capabilities and integrated horn systems. Customizable alerting thresholds will allow venues to set up range rings that alert when hazardous weather, such as lightning strikes, enters pre-set advisory or warning zones. The NCAA recommendation for lightning alerting is to receive an advisory alert when a strike is detected at 15-30 miles (range dependent on event size) and a warning (and subsequent suspension of play) when lightning is detected within 8-12 miles (range dependent on event size). As each weather event is unique, radar storm corridors can provide precision details on the movement, timing, and intensity of individual storm cells. Some professional weather services provide online and mobile consulting forums where professional meteorologists can quickly answer questions on impending weather to help their clients proactively plan. Upgraded services may include consultation with a dedicated meteorologist. This individual can monitor the venue location and proactively call the event managers or directors when inclement weather is approaching.

Another option is to utilize a meteorologist on-site at the venue as part of the operations team. In fact, for larger crowds (2,000+ attendees) and potential adverse weather, the Intercollegiate Athletics Safety and Security Best Practices Guide states that a dedicated expert is a must as "on-site expertise eliminates searching for the right answers if an emergency arises."



With an on-site expert in place, operations staff, managers, and directors will be able to talk face to face with a meteorologist who can provide actionable insights to each unique weather situation. The expertise of this professional will provide confidence to make timely, correct decisions and minimize the potential for false alarms. The meteorologist may set up mobile lightning detection equipment and would possess the skills and tools necessary to analyze crucial data in order to monitor quick-changing conditions. In addition to providing briefings of custom forecasts or daily planners, the on-site meteorologist actively monitors developing weather and assists with the evacuation plan — providing any suggestions to make improvements.

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The value of accurate weather information

Developing a specific weather-related safety plan and utilizing modern real-time weather information such as high-resolution single-site radar and real time lightning information are crucial elements to navigate a successful event through episodes of inclement weather. The foundation of both is underpinned by a common factor — accurate weather data. Inaccurate forecasts or analysis of apparent threats that result in unnecessary delays or suspensions can cost an event upwards of hundreds of thousands of dollars when considering the expenses required to reschedule transportation, lodging, staffing of facilities, security, and satisfy any media agreements. Not only are these false alarms costly to the event organizers and sponsors, they result in apathy in the general public — making them less likely to take threats more seriously in the future.

Though a free, or basic, weather application or service may be tempting to use in order to avoid the nominal upfront costs of professional weather services, these simple applications are usually limited to lower resolution, delayed radar data, and unreliable alerting. Most have sparse surface observation data and will not likely provide access to accurate, real-time lightning data. With lives potentially at stake, accurate weather data is essential when dealing with something already as unpredictable



as the weather. Sound weather intelligence is required to remove uncertainty and indecision — strengthen confidence in any potential call regarding suspending, evacuating, or canceling an event.

Beyond keeping people safe and limiting costly false alarms, insurance companies now recognize the value reliable weather data has in mitigating the risks to the public from adverse weather. Many insurers have developed policies that will cover events that need to be postponed or canceled due to inclement weather, and insurance premiums typically increase for events that do not utilize professional weather services.

Conclusion

A holistic approach to safety at outdoor events and venues requires a thoughtful and complete weather-related action and evacuation plan. The ability to monitor weather conditions in real-time with accurate information, while communicating the threats in a timely matter are imperative. Working collaboratively with an expert weather partner will allow for a given event or venue to confidently make decisions — reducing the potential human impact from adverse weather conditions while also limiting the financial implications that may arise from inaccurate or unreliable weather data. The decisions and actions made around inclement weather can make-or-break a successful event, so why not utilize all the capabilities that professional weather services have to offer?



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