



Safety First: Managing Weather Risk and Evacuations at Outdoor Events

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Introduction

Seattle is famed for its inclement weather. Yet team management for the Seattle Seahawks, a professional American football franchise based in Seattle, Washington, was juggling multiple free websites to try and predict the weather conditions before games - and understand if these conditions posed a threat to public safety.

Storms, especially lightning, are a real threat for the staff, spectators, and players in the 72,000-seat Seahawks open-air stadium. Any miscalculation in the forecast could leave all these people exposed; the stakes were too high for the Seahawks to continue to rely on a free service. They knew they needed something more accurate and reliable.

By adopting an integrated weather system, the staff has a complete view of conditions in real time, including radar, storm corridors, wind, lightning, and more. Team staff at the Seahawks can set customized alerts based on the GPS location of their phones and have notifications sent right to them when severe weather is approaching. The management now monitors lightning in real-time, as it approaches, using this insight to help make the right decisions to keep people safe during a game.

And the weather is just as critical to the team's safety during weekday practices as it is during fixtures. Detailed reports on precipitation, temperature, and humidity help them determine whether to play indoors or outdoors, on grass or artificial turf, to keep players safe from the weather.

In 2011, a similar system proved invaluable at the football season opener for the Notre Dame Fighting Irish at Notre Dame Stadium, Indiana. It delivered real-time lightning strike displays, which showed the weather conditions would put student-athletes and fans in danger. University officials suspended the game twice, then, when the storm headed directly toward the stadium, the system sent alerts to officials' phones that fans should seek safety.



Officials decided to evacuate the stadium for the first time in its history. Officials utilized the campus address system, text messaging, and emails to alert staff to evacuate all 80,000 spectators into the concourses. As fans were safely indoors, team officials could see lightning strikes happen around the stadium, supporting their decision to evacuate.

But, of course, the weather isn't just a threat to outdoor events in the United States. As recently as summer 2019, [festival and event organizers across the United Kingdom](#) had to react fast when unseasonable August weather,

including thunderstorms and 60 mph winds, posed a public safety risk. And in February 2020, [stormy conditions forced organizers](#) to cancel the Carnival parade in Eindhoven, Netherlands, due to safety concerns.

These examples are clear: adverse and severe weather conditions can and do affect outdoor events quite often. For organizers and managers, mitigating the impact of weather, reacting swiftly to circumstances as they emerge, and having an evacuation plan in place for when conditions pose a safety threat is non-negotiable.



Why weather-related safety plans are essential for outdoor events

Studies suggest that incidents of adverse [weather-related disasters](#) and severe weather conditions will increase in the coming years, which presents a real risk to public safety for people attending outdoor events. However, when utilizing a professional weather service, these conditions are often forecast early enough to enable sports and recreational events to postpone or cancel. Modern decision support tools provide actionable insights, and the necessary weather information to protect lives and keep people safe. As a result, it's possible to either inform people before they arrive not to come to the event or communicate with them at the venue to evacuate and enable them to get out of harm's way.



Impact on safety and evacuations

The public expects authorities and organizers to put safety first. Opportunities to mitigate risk and improve preparations for unsafe weather ensure you're not left exposed when severe weather strikes.



Factor #1. Protect lives and keep people safe

Event managers and organizers all have a responsibility to the public to keep them safe. In situations where severe weather conditions pose a threat to life, organizers and authorities have a duty of care to monitor conditions for potential weather hazards.

Early awareness provides valuable time to enact evacuation plans and to get people to secure places. Weather conditions can change fast. Without the right tools to monitor progress, it slows down warnings and delays evacuations.

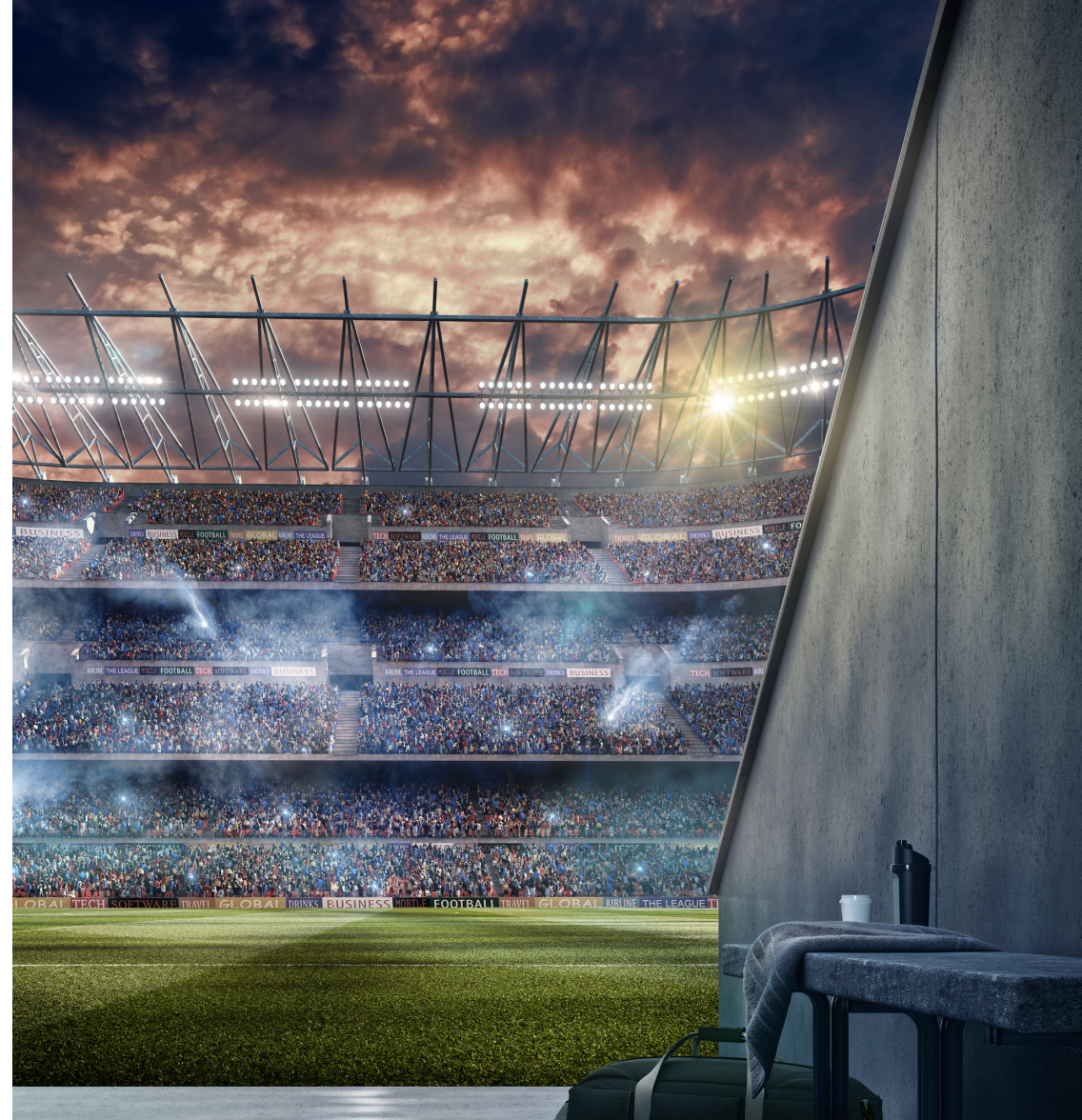
By not taking the proper precautions for public safety, it risks not only reputational damage due to poorly organized evacuations, but it also puts lives at risk.

Factor #2. Help the public remain calm during weather emergencies

People will typically panic if they're not sure what they need to do. When panic sets in, they're more likely to put themselves or others in danger. This scenario is particularly a problem if people are in an unfamiliar location, where their knowledge of the area is incomplete.

On the other hand, research into preventing dangerous evacuation behavior suggests that it's vital to make the severity of the situation clear. Delays in evacuations due to adverse weather can occur if the communications are ['too calm and friendly.'](#)

A detailed evacuation plan helps to get the balance right between sharing clear instructions and maintaining calm - essential to support effective evacuations.



Impact on safety and evacuation

Understanding how people will behave during an emergency evacuation is vital. The challenges with predicting human behavior mean this isn't easy, but modeling it will help ensure people react appropriately to the severity of the situation.

Factor #3. Increases in severe weather increase the likelihood of weather impacting events

Studies show that heavy rain events have become more frequent. Flooding incidents and extreme rainfall events have increased by more than 50% this decade, which can impact events taking place in or around water. These incidents are now occurring at a rate four times higher compared to 1980, according to [a report](#) by the European Academies' Science Advisory Council (Easac).

In the United Kingdom, experts have warned the country must prepare for [more storms](#) like those experienced in February 2020, which caused major disruption to events and transportation links.

But it's not just storms and rainfall that are a cause for concern. In 2018, a heatwave forced the cancelation of the [Highland Games in Scotland](#), showing that high temperatures and summer weather can also prove to be problematic for event organizers.



Impact on safety and evacuation

The evidence suggests that the likelihood of adverse weather occurring is increasing, resulting in a greater need for an evacuation plan to mitigate risk and support public safety at your event.

Putting safety first is non-negotiable. Effective outdoor event risk mitigation and evacuation plans are essential to protect lives, minimize threats from the weather, and keep the public safe and calm during any weather-related incidents. But alongside this responsibility, organizers must recognize that with increases in severe weather incidents, it's becoming more likely that an outdoor event will be affected by the weather.



How to plan for evacuations and manage the weather risk

For evacuations triggered by adverse weather to be effective, planning is essential. Unfortunately, it's not enough to wait and see before considering the evacuation plan: it needs to be in place before dangerous weather conditions develop.

#1 Establish safe weather parameters for your situation

Every event is unique. Adverse or even hazardous weather in one scenario may not be such a risk elsewhere. The impetus, therefore, is to establish what the safe weather parameters are for your event and circumstances. In situations where the weather conditions are marginal, accurate data can be the difference between having to evacuate or not. The University of Notre Dame, for example, has had several calls with lightning during football games. Each time, the weather data has been there to help make the right calls on whether or not to suspend play and get spectators to safety.



#2 Plan how you'll activate evacuations

To start, be clear on what level the thresholds need to be to activate the evacuation plan. Then, detail what the expected steps are for the people involved: Is it the same for everyone, or do specific roles (for example, emergency services) follow a different course of action? Equally, understand where you are going to evacuate people to and how long it will take to get there so that you can allow enough time.

For the Lone Star College Athletic Conference, headquartered in Richardson, Texas, accurate weather data means the conference members can rest assured they'll have the advance notice they need to make the right decisions. For each of their locations, they have the time necessary to put plans into action.

#3 Document your communications process

What is the process you have in place to alert and inform people when evacuations need to take place? Keep in mind that decision-makers may not always have a device to hand at crucial moments, so what steps do you have in place to inform them when they don't have their mobile?

As well, how is this message conveyed to the general public? Know the answers to these questions ahead, as it reduces pressure when making decisions. At the University of Notre Dame, for example, officials utilized the campus address system, text messaging, and emails to alert staff to move all 80,000 spectators to safe locations into the concourses.

#4 Prepare and brief your team

Everyone involved in supporting an evacuation needs to know the expectations. Practicing and briefing teams in advance helps people to remain calm when adverse weather occurs, meaning they're faster to react when an evacuation is needed.

At Lawrence Academy, Massachusetts, offsite coaches can easily pull up weather information on their phones wherever they are. Staff can also send a question directly from their mobile phone to a meteorologist and receive an answer within 15 minutes, helping to keep the whole team prepared and briefed.



Considering all aspects of weather when mitigating risks

An easily overlooked weather element is night-time temperature.

At Tomorrowland, a festival over two weekends in Belgium, the Red Cross was very eager to hear from the weather experts if night-time temperatures would fall below 15 degrees Celsius, as this is the proven level of risk of hypothermia. It doesn't sound that cold, but it can turn out fatal.

As the music stops, visitors still need quite a bit of time to get to the exits and the campsites. In relatively cold air, the body starts to lose more warmth than it's generating. In this situation, stopping for a small rest can be a bad idea.

It's essential to focus on the risks. For example, if heavy showers are coming, you can start indicating the risks about 12 hours in advance. The weather experts can tell festival organizers when to expect showers and the other weather phenomena like high winds,

hail or lightning that could accompany the showers. For example, no high wind gusts are anticipated, or the showers will be short-lived. Or, in other cases, showers might bring lightning or torrential rain.

In the following hours, the experts can fine-tune the forecast, while informing everyone and indicating the ifs and buts. When showers are closing in, they turn to nowcasting.

This situation occurred at an event in the municipality of Barneveld, in The Netherlands. During the annual conference of the association of Dutch Municipalities (VNG), forecasts indicated a possibility of thundershowers nearby.

The experts warned organizers in time, and they stopped the party an hour early. They got all the guests inside busses and on their way to their hometowns - just before the heavy showers arrived.

How highly accurate weather data supports effective evacuations

So far, we've outlined the purpose of weather-related evacuation plans for outdoor events and the steps to consider when planning and preparing for evacuations. But underpinning all of this is a common factor: accurate weather data. When lives are potentially at stake, data accuracy is essential when dealing with something as unpredictable as the weather. Let's take a look in more detail at the ways accurate weather can help support safety at outdoor events.

#1 Keep people safe and know when you need to evacuate

First and foremost, accurate weather data keeps people safe and protects lives. It reduces second-guessing and makes it clear when evacuations need to happen.

Accurate weather forecasts will give you as much warning as possible that conditions could become dangerous, and when evacuations need to begin. This insight provides extremely high value and added time to move people to safety and helps to reduce the impact of severe weather.



#2 Only evacuate people when necessary and minimize false alarms

Studies suggest that ["whenever people experience a false alarm a few times, they seem to not believe the alarm anymore."](#) As a result, it's beneficial only to evacuate people when necessary. False positives can result in apathy, which means people are less likely to leave when a genuine need to evacuate occurs.

Relying on a free or a basic weather product means you need to allow a higher tolerance in what the data is telling you. As a result, a higher frequency of inaccurate calls are likely. Accurate weather intelligence reduces the likelihood of false alarms and, therefore, strengthens the impact of calls for evacuation.

#3 Document your communications process

Accurate weather data means you're much less likely to miss warnings of a potentially threatening situation. Additionally, people panicking in an evacuation is a threat to safety, as they're more likely to behave irrationally and possibly put themselves in danger.

By instilling the confidence that safety decision-makers are making the right decisions based on the most accurate weather data to inform them, it helps to bolster the public perception and ensure peace of mind.

#4 Decrease insurance premiums by reducing the risk

There is a growing pressure for sports and events organizations to utilize weather support solutions, as higher insurance premiums typically increase for events that do not utilize professional weather services.

The right insurance policy will cover events that need to be postponed or canceled due to adverse weather. By using professional weather services, it can reduce insurance premiums. This benefit is because insurers recognize the value reliable weather data and meteorological consulting has in mitigating the risks to the public from adverse weather

Have confidence in Go or No Go situations

What's the risk:

Events are planned well before the precise weather conditions are known. As the event draws nearer, organizers and meteorologists alike will begin to have a clearer idea of what the likely forecast will be. But they need the confidence to make their Go or No Go call.

If the forecast shows they should go ahead, they need to be confident that conditions will not change and subsequently impact safety. However, if the weather data does show now informs the event and the alerting system that the conditions will be unsafe, they need to make a 'No Go' call in a way that ensures everyone knows.

How alerting can help:

Accurate weather data and meteorological consultation with experts ensures organizers can be confident in their decisions. In situations where the weather conditions are marginal, accurate data and meteorologist assessment can be the difference between going ahead or canceling. The impact here is potentially huge. Not only unnecessary scheduling changes and what that means financially in losing your event time and date, but it can also be days, weeks or longer before you're able to reschedule if the forecast shows they should go ahead, they need to be confident that conditions will not change and subsequently impact safety. However, if the weather data does show now informs the event and the alerting system that the conditions will be unsafe, they need to make a 'No Go' call in a way that ensures everyone knows.

The weather data at work: How insights are delivered

Protect yourself from the heat

Wet bulb globe temperature forecasts and customizable alerts help assess heat-related risks. Wet bulb globe temperature is a composite temperature indicator used to determine the real effect of hot weather on people. It is a more comprehensive and reliable measure of the impact on the human body than the heat index or 'feels-like temperature,' which reflects just air temperature and relative humidity. Wet bulb globe temperature also takes into account cloud cover, sun angle and wind speeds into the calculation.

Wet bulb globe forecasts are available at hourly and daily intervals, along with current observations. Get notifications for each level of concern, as well as an all-clear alert for when conditions improve.

See when and where storms will strike

Use a specialized storm corridor to see where severe weather is and where it's headed over the next 30 minutes. Drill down to see specific attributes about individual storm cells, such as large hail potential or tornadic activity. In addition to the storm details, storm path tracking lists the locations in the path of the storm and the number of minutes until the storm arrives at locations.

React when lightning occurs

Access to real-time lightning information is critical. Free internet websites and apps don't update frequently enough — sometimes only every 10 or 15 minutes —, don't show all of the data, and don't alert, which can provide a false sense of security or danger. And using the "flash-to-bang" method is unscientific and unreliable, as lightning can strike as far as 10 miles or more away from the parent storm. With advanced lightning tracking technology, monitor lightning as it approaches your area, as well as set up custom advisory, caution and warning ranges for a specific location.

Accurate weather data helps to protect the public from the impact of severe weather and supports a complete holistic approach to public safety and outdoor evacuations. Additionally, by working collaboratively with an expert weather partner, you can unlock valuable insight that isn't available from a basic weather service. This detail helps ensure evacuations are successful and reduces the potential human impact of adverse weather conditions on outdoor events.