

# Weather resources for show crews

BY JOHN HUNTINGTON

ON A HOT, CLEAR JULY AFTERNOON, we were wiring up the show's last speaker tower in the middle of Central Park's Great Lawn. Then we saw it—a black, foreboding soup of a sky off to the west. The winds picked up, the temperature dropped, and we heard the first thunderclap. We quickly tarp up the amp racks and scattered to the ring of trees surrounding the Great Lawn. Trees are generally not a great choice during a thunderstorm, but, in our haste and with no advance plan, we thought them to be a better option than a 30' grounded metal tower in an open field. Then—painfully loud and close—came one of those crystalline thunderclaps that you can feel in your gut. That was finally enough to scare a stubborn crew member (working for the shop that provided the gear) away from the tower. He was lucky that the bolt hadn't been a bit closer, and we were all lucky that no one was hurt and nothing was damaged in the strong storm.

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That was 15 years ago; in those days, it was tough to get good, real-time weather information on site, and we were often surprised by quickly changing conditions.

Today, of course, it's easy to get lots of good information on the Internet, but last summer's string of tragedies show how seriously we need to take weather threats. While I'm enough of a weather geek to be comfortable chasing tornadoes (when I'm putting only myself at risk), that does not make me qualified to give weather advice to a producer or promoter regarding the well-being of the public. That's a job for experts.

### Event meteorology

As part of overall event safety, it is the responsibility of the promoter, or producer, or employer to establish weather monitoring procedures, specific action thresholds, and a weather-related decision hierarchy in advance. Equally important to having a good plan is that the show management is in continuous consultation with a meteorological expert like Brian Peters, who has provided expertise for events ranging

from the Atlanta Olympics to the annual Schaeffer Crawfish Boil concert festival in Birmingham, AL, with typical attendance of around 50,000. When Peters is hired for

an event, he monitors and “nowcasts” a wide range of weather conditions that could have an impact on a venue. “This means all kinds of weather,” he explains, “everything from heat to wind to lightning to rain. What you don't know *can* kill you. Any event that attracts more than 1,000 people owes it to the staff, performers, and audience to have meteorologists watching out for weather that can threaten. And courts no longer buy the ‘act of God’ excuse when weather events do occur, because plans to mitigate the impact of weather can and should be devised.”

As crew members, though, we don't always get to choose our employers, and we can find ourselves working gigs where the producer has not fully embraced his or her safety responsibilities. So, in the same way that I would refuse to climb a broken ladder—even if it meant being fired—I would refuse to climb up to a truss spot position if the show site was under a severe thunderstorm warning. One of the best ways to manage risk is to be prepared; in general, when dealing with weather, this means being informed.

### Weather Resources

There are many commercial weather services available online (see sidebar on page 29) but I mostly use the one that we already pay for: The National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS). Each area of the United States is covered by a local NWS forecast office with a meteorologist on staff 24 hours a day, who continuously updates forecasts. Once on a show site, the old standby, NOAA

weather radio, is still a good option for alerting you to severe conditions. These days, it's best to get a Specific Area Message Encoding (SAME) radio, which allows you to enter location-based codes, meaning the radio will only go into alert mode when a warning affects your specific area; this would be especially useful, for example, at a permanent summer festival site. However, it can be difficult to wade through all that warning information from a speaker during a show, so I leave mine muted but with the alert light on when at the mix position. In addition, when the NWS issues a watch or warning, it issues the warning for a geographically-based polygon. If that polygon touches the corner of your county, the SAME alert can go off even if the actual threat is 50 miles away. This can lead to alert fatigue and complacency, so if you have Internet access, I find it useful to actually look directly at the warning details. (Some of the more advanced radar programs draw the polygons on a map for you).

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Another great option these days is the delivery of severe weather alerts to your phone. While the National Weather Service doesn't send out text messages, there are many commercial providers (see sidebar on page 29) who, either for free or a small fee, will alert you to severe conditions for one or more locations. I've found these alerts to be very helpful; on many occasions, I've gotten my text or email notification *before* my NOAA weather radio went into alert mode.

But what if you're on tour? There's an app for that: iMapWeather Radio, which, for \$10, uses the phone's GPS to see if you are within the warning polygon, wherever you are in the country, and alerts you even if the phone is asleep. This should cover you even on the bus on the way to the gig. As of this

writing, the program is available only for the iPhone, but the company has announced that an Android version is in the works.

Just about anyone with a smartphone today can have access to weather radar data. "The biggest issue I see with any weather app," says Peters, "is the misinterpretation of what you see by people not trained in meteorology. Like any technical area, there is much more to the accurate interpretation of data than simple pictures. Some events are very clear-cut, but the vast majority of severe weather events are not." For example, when the Indiana State Fair stage roof collapsed, the storm's rain had not yet arrived, and a quick look at a smartphone radar might lead someone to think the storm was still some miles distant. However, the winds that toppled the stage roof created an outflow boundary, which was clearly visible on radar if you knew what to look for and had the right tools.

Given that caution, looking at radar can be useful, and free sites provide a

composite, easy-to-read screen that can give you a general idea of what's going on. Be sure to check the time stamps on this information. Radar data is generally updated by the NWS every 5-10 minutes, and it may take some time for the sites to get the data out to you. Personally, as a weather geek, I use a sophisticated \$10 app called RadarScope on my phone, and the \$80 PC program GRLevel on my laptop, with a \$10/month Allison House data feed, which, in addition to radar, gives you station observations, watch and warning polygons, lightning strike data, et cetera. Another great and inexpensive provider is the \$8/month Weathertap, which also provides text messages, forecast model information, radar and warnings, and more. Accuweather sells a Pro package for \$250/year. Keep in mind

that all of these providers present timely, but raw, data, and it takes a fair amount of study and experience to learn how to accurately interpret the information.

## Severe storms, watches and warnings

We've all seen strong storms, but what makes a storm "severe"? To the National Weather Service, severe weather is that which "pose[s] a threat to life and property," while a severe thunderstorm is capable of "... producing hail that is at least quarter size, 1" in diameter or larger, and/or wind gusts to 58 mph or greater, and/or a tornado" (answers 4.1 and 2.1 at <http://www.spc.noaa.gov/faq>). Few temporary outdoor stage structures are rated for severe storm wind speeds, and 1" hail or a tornado is most certainly a threat to crew and audience.

The NWS issues both "watches" and "warnings." While these terms cause confusion among the public, the difference is pretty simple: "A watch means severe weather is possible during the next few hours, while a warning means that severe weather has been observed, or is expected soon" (answer 2.4 at <http://www.spc.noaa.gov/faq>). I'm extra-vigilant when my show site is under a *watch*, and I plan to take action as soon as a *warning* is issued for my location.

The media often states that storms strike "without warning," but that is rarely the case. "In 2011, there were 511 tornado deaths in the US," says Peters, but "only one death was recorded outside a tornado watch area." According to the official time line, the show site of the Indiana tragedy was under a severe thunderstorm *warning* for seven minutes before the stage roof was blown over, and the whole area was under a severe storm *watch* hours before that.

## My process during a show day

How does one deal with all this information to help make safety decisions onsite? Here's a hypothetical<sup>1</sup> example of my process. I'm

# Weather resources

## NOAA Weather Resources:

Main NWS Site:

<http://www.weather.gov/>

Find your local office by clicking on the map or entering your city.

SAME Weather Radio:

<http://www.nws.noaa.gov/nwr/nwrsame.htm>

Skywarn Program: <http://skywarn.org/>

Mobile Weather Alert Resources:

The Weather Channel Free Text Alerts:

<http://www.weather.com/mobile/textmessaging.html>

Accuweather's Free Email Alert:

<http://www.accuweather.com/alerts/index.asp>

Notify NYC: <http://www.nyc.gov/notifynyc>

## Advertiser-Supported

### Commercial Weather Resources:

Accuweather:

<http://www.accuweather.com/>

The Weather Channel:

<http://www.weather.com/>

iMap weather: <http://imapweather.com/>

Weatherbug:

<http://weather.weatherbug.com/>

Weather Underground:

<http://www.wunderground.com/>

### Paid Weather Resources:

Radarscope App:

<http://www.basevelocity.com/>

GRLevel Radar Software:

<http://www.grlevelx.com/>

Allison House Data:

<http://www.allisonhouse.com/>

Weathertap: <http://www.weathertap.com/>

Accuweather Pro:

<http://www.accuweather.com/ProBenefits.asp>

iMap Weather Radio App:

<http://www.imapweatherradio.com/>

Brian Peters' company, Coleman, Knupp, and Peters, LLC:

<http://www.ckpweather.com/>

on tour, and tonight we're doing an outdoor festival in Tulsa, OK. I wake up on the tour bus, and check the NWS "point forecast":

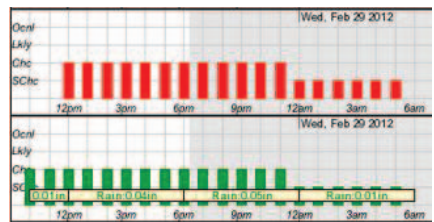
**Detailed 7-day Forecast**

Hazardous weather condition(s):

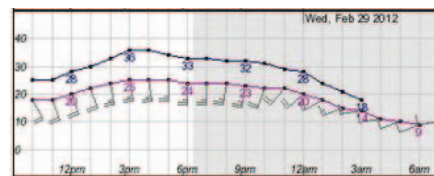
**Hazardous Weather Outlook**

**Today:** A chance of showers, with thunderstorms also possible after noon. Cloudy, with a high near 67. Breezy, with

There's a red flag. That "hazardous weather outlook" is only there when something serious is forecast, and in this case, clicking on the outlook gives, "severe thunderstorms possible this evening and overnight." Weather service forecasters choose their words carefully, and, by "severe," they mean large hail, 58 mph or higher winds, or a tornado. Also, they said *possible*. As good as forecasting has become, it's still an inexact science. With a chance of severe weather, I will be monitoring conditions today. I next click the "hourly weather graph," and a couple things catch my eye. First, these red bars show a good chance of thunderstorms, with the chance diminishing after midnight.



But, given the spotty nature of thunderstorms, we might be able to get the show in safely anyway. However, there's another issue:



This is the hourly forecast wind graph, and the purple (lower) line shows the forecast wind speed, which is peaking at about 25 mph. The blue (upper) line shows gusts forecast up to 36 mph in the afternoon.

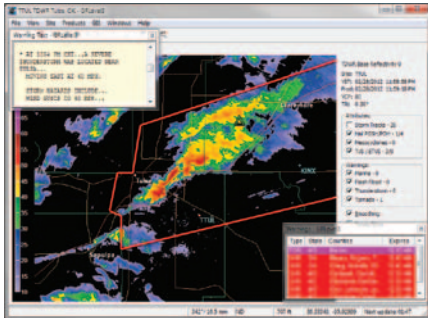
Fortunately, today's promoter is top-notch, and has hired an event meteorologist to monitor conditions for the setup and show. At the start of the call, our production manager has a quick meeting with all the crew heads to tell us that the event meteorologist is now forecasting that winds at our location will likely remain within safe operating limits of our stage roof. But, since there is still a chance for severe weather, the production manager goes over the safety plans established for this show site. Late in the day, my phone alerts me, and checking online, I see this:



My show site is now under a tornado watch (indicated by the area enclosed by the red line), and there is a line of storms (the red, yellow, and green blobs) moving (generally) towards my location. Remember, a watch means, "severe weather is possible during the next few hours." At this point, I double-check with my production manager to make sure everyone is aware of the situation, and while I'm still going to be vigilant, I'm really glad that this promoter has hired a meteorologist to stay on top of things (at our tour stop last night, we were on our own).

In the end, our forecaster was right, and while it's breezy, the show goes well, and comes down at 9:30 p.m. We are closing the door on the last truck when I get another alert on my phone: We are now under a severe thunderstorm warning. Remember this means that "severe weather has been observed, or is expected soon." On the bus, I take a look at my laptop radar program,

and see that while we are inside the warning polygon (the red outline), it looks like the worst of the storm will miss both the show site and our route out.



My investment of a few minutes watching the weather has given me peace of mind today. The next morning, I realize that if those storms had veered a little south, we could have had a dramatically different and potentially deadly situation. The same storm that passed near Tulsa that night went on to spawn a tornado that tore up the entertainment district in Branson, MO, only 150 miles or so to the northeast; other parts of the same system created deadly tornadoes in southern Indiana.

If you end up catching the weather bug, I'd suggest learning as much as you possibly can about the field. The more you learn, the more interesting it becomes. A great next step is to get trained as a Skywarn spotter; check with your local NWS office to see if they offer this very informative class, which shows you what to look for in the sky. Once trained, you can even help the NWS by reporting what you see.

One thing we can all do is ask our production managers, producers, and promoters where they are getting real-time, expert weather advice. The series of horrendous stage roof collapses last summer may not have been preventable—even strong, permanent structures can be scrubbed down to their foundations by severe storms. None of the storms that struck stages last summer—whether in Ottawa, Tulsa, Indianapolis, or Belgium—were “freak” occurrences, and not a single one hit “without warning.” ■



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He has been working on large outdoor events since 1996, including 10 years with the New York Philharmonic and Metropolitan Opera summer parks tours around New York City, and the Tribeca Film Festival outdoor *Drive In*, for which he has designed the sound system since 2004.

<sup>1</sup> *The data and screen captures here are real and in sequence, taken from February 28, 2012, a day I was working on this article. While the temperatures would likely be a bit higher on a summer tour, this kind of storm system is not unlike many summer storms throughout the country.*

## PLASA introduces a new member benefit

PLASA members will receive a discount on Accuweather Skyguard Warnings service. Skyguard is a site-specific warning service based on criteria provided by the member to the Skyguard meteorologists. Details will be announced shortly.

Keep watch at [www.plasamembers.org](http://www.plasamembers.org) for up-to-the-minute information on member benefits and the details on how to take advantage of them.

