

Preparing for Severe Weather and Natural Disasters



Using Mass Notification and Critical Event Management to Keep People Safe and Informed

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Executive Summary

Understanding the Threat

The Cost of Being Unprepared

INVESTING TIME AND RESOURCES

Natural disasters can have a devastating impact on any organization if plans and procedures are not in place to keep people safe. This starts with understanding what kind of events your organization needs to prepare for and what kind of tools you have in place to share information with all of your people in the event of an emergency. Organizations that do not take the time or invest the resources to create a comprehensive response plan for natural disasters can face catastrophic consequences. Here are some events your organizations may wish to create plans for, and some recent statistics that highlight how damaging these events can be if you're unprepared.

TORNADOES

According to the National Oceanic and Atmospheric Administration (NOAA), in 2021 there were a total of 1,376 tornadoes in the United States. Texas alone witnessed 118 tornadoes.

THUNDERSTORMS

The National Severe Storms Laboratory under NOAA reports that there are roughly 16 million thunderstorms each year worldwide, and about 100,000 take place in the United States. About 10 percent of these reach severe levels.

BLIZZARDS

The 2021-2022 winter saw a lot of snowfall including a record-breaking blizzard in March. Winter storms caused a record \$15 billion in insured losses in 2021, according to Aon.

HURRICANES

The National Hurricane Center reported that 2021 ranked as the third most active hurricane year in history with 21 named storms. Storms Elsa, Fred, Nicholas, and Ida each inflicted more than \$1 billion in costs according to NOAA.

EXTREME TEMPERATURES

According to NOAA, the cold-air outbreak observed from February 10-19, 2021 was the coldest event observed across the contiguous U.S. in more than 30 years and caused power outages for almost 10 million people. In addition, approximately 14.6 percent of the contiguous U.S. observed its warmest June on record in 2021, including an unprecedented heatwave across the Pacific Northwest.

FLOODS

About 90 percent of all U.S. natural disasters involve flooding, according to the National Flood Insurance Program (NFIP). In 2021 NOAA's National Centers for Environmental Information (NCEI) reported there were two flood events that cost over \$1 billion, located in California and Louisiana.

The Cost of Being Unprepared (cont.)

WILDFIRES

As reported by the National Interagency Fire Center's (NIFC), in 2021 in the United States 58,733 wildfires were reported across the country that had burned more than 7.13 million acres.

EARTHQUAKES

In 2021, the United States witnessed one earthquake above a magnitude 8, and nine earthquakes between magnitudes 7-7.9. The United States Geological Survey (USGS) also reports that California is subject to the most damage-causing earthquake occurrences.



VOLCANOES

According to the Global Volcanism Program at the Smithsonian Institution, there were 79 confirmed volcanic eruptions in 2021. 75 different volcanoes erupted with 31 being new eruptions that started during the year. USGS notes that at-risk individuals, such as children, the elderly, or those with preexisting conditions, are at risk of lung problems if volcanic ash is inhaled.

Each of these events can impact operations and the well-being of your people, but each requires a unique response to effectively keep people out of harm's way. In this eBook, we'll go over how mass notification systems with critical event management capabilities can be leveraged to automate safety plans that deliver effective messages during a crisis.

The Role of Mass Notification

THREE KEY FACTORS

It is likely that your organization already has tools and procedures in place to help respond to natural disasters, so you may be curious as to what advantages mass notification can offer over those solutions? The answer comes down to three key factors: speed, reach, and comprehensive planning.

SPEED

Natural disasters are often unpredictable. They can occur with little or no warning, which means your organization needs to be ready at a moment's notice. With a mass notification system, you can prebuild and automate text and audio messages that go out with the push of a button or when certain monitored criteria are met. This means messages go out faster and people take action more quickly.



REACH

Since you never know when a natural disaster can strike, it's important to have the flexibility to reach people at any time wherever they are. Mass notification systems offer organizations unparalleled reach with the ability to connect to on-site and mobile devices to deliver critical messages. Every communication channel can be leveraged to share information that keeps people out of harm's way.

COMPREHENSIVE PLANNING

Simply knowing that a natural disaster is occurring is only the first step in keeping people safe and minimizing the disruption to your operations. Mass notification systems are adding critical event management capabilities that help organizations put every resource they need to handle an event in one location. Initial alerts, follow-up messages, and "All Clear" notices can all be grouped under the same event, alongside resources like safety checklists and floorplans to help map out every step of your emergency response plan.

Throughout this eBook, we will provide a more detailed explanation of how mass notification systems can be leveraged to actively monitor natural disasters and severe weather, help ensure everyone's safety, and reduce the overall impact these events can have on your organization.

Setup and Configuration

Receive the Most Relevant Alerts

Leveraging CAP

WHAT IS CAP?

Common Alerting Protocol (CAP) is an open, XML-based, digital message format used by the National Weather Service, US Geological Survey, and Department of Homeland Security to alert people about potentially dangerous events. This format allows for the exchange of public emergency notifications between many different mass notification technologies that are available and in use today.

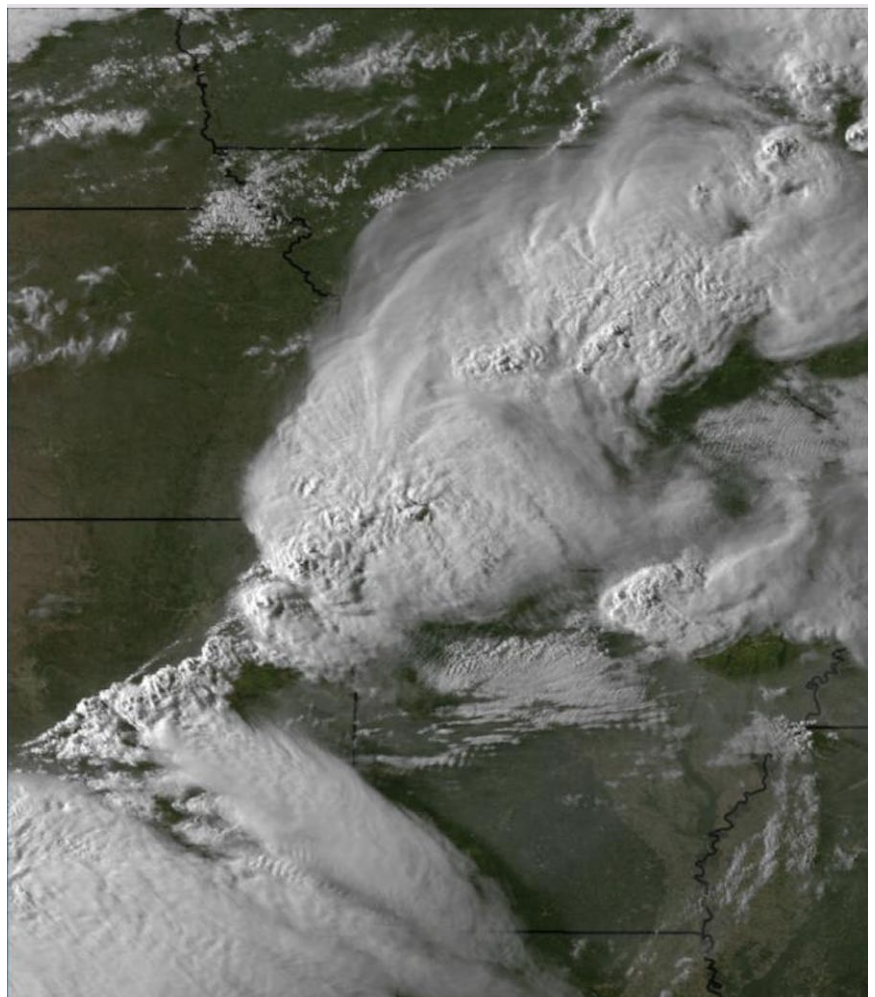
Using a mass notification system, you can actively monitor CAP feeds for announcements about relevant natural disasters occurring in your area. Parameters can be configured for particular geographical areas and the types of events that would cause the most disruption to your operations.

RAISING AWARENESS

When monitoring is properly configured and parameters are met, notifications can automatically be triggered to send throughout your organization. Messages can be sent as text, audio, and visual alerts to a wide array of devices and systems. Organizations can also select who receives certain messages depending on the event. Some might only require select upper-level administrators to be notified while others require an immediate alert to be sent to the entire organization.

CAP feed monitoring makes it easy to automate alerts so you do not need to waste manpower keeping an eye on the weather or using calling trees to let people know how a natural disaster has impacted operations. This makes alerting more efficient and gets information into the hands of people who need it sooner. In turn, this speeds up response times so decisions makers can take action to reduce risk and preserve continuity as much as feasibly possible.

In the next section, we'll go over the information your organization will need to gather and configure to set up CAP alerts within a mass notification system.



FIPS 6, UGC County, and UGC Zone Codes

GATHERING INFORMATION

Setting up automated alerts with CAP requires some information gathering and configuration to ensure your organization is monitoring for the correct events in the right geographic area. We'll walk through the steps of this process so you can understand exactly what you need to know and do to set up your alerts accurately.

KNOW WHICH EVENTS YOU WANT TO MONITOR

The National Weather Service uses precise text when posting information about events. That text needs to be mirrored in your mass notification system to monitor and receive alerts for the correct event.

KNOW WHERE YOU WANT TO MONITOR

The CAP data in a weather alert posted by the National Weather Service will contain many attributes to describe geographic areas and locations. You need to locate the values of these attributes for your location, often based on the county your site is located.

FIPS 6

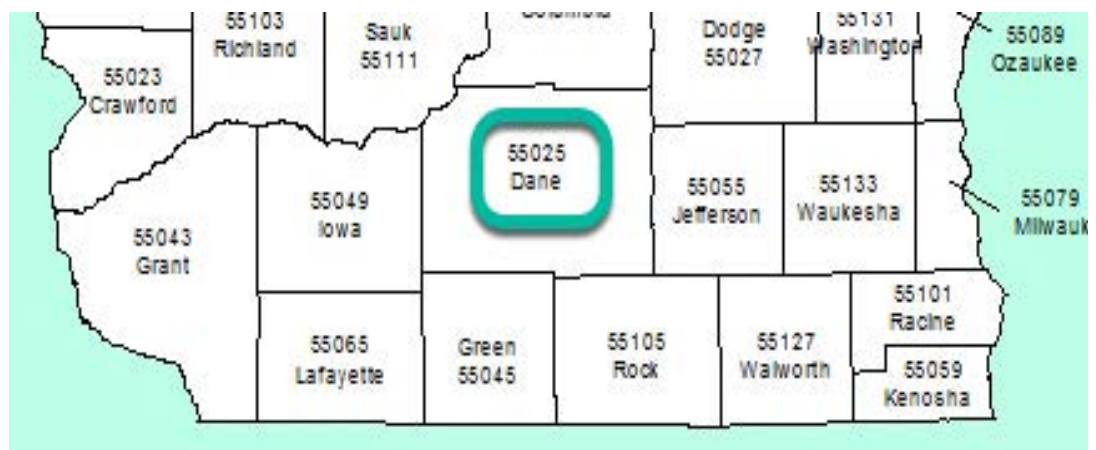
The Federal Information Processing Standard Publication 6 (FIPS 6) is a five-digit code that identifies counties in the United States. Codes are unique to a county of a state and contain a two-digit state number and a three-digit county number. These can be found on the National Weather Service website.

UGC COUNTY CODES

The UGC County Codes map to the county of a state and contain a two-letter state abbreviation, the letter "C" for county, and the digit county number. These can be found on the National Weather Service website.

UGC ZONE CODES

The UGC Zone Codes map to Weather Forecast Office areas of public forecast responsibility. Codes contain the two-letter state abbreviation, the letter "Z" for county, and the digit zone number. These can be found on the National Weather Service website.



With this information compiled ahead of time, your organization will be able to receive relevant, automated weather alerts about events that could impact your operations and your people's safety.

Harness the Power of IPAWS

EXTENDING MESSAGE REACH

During a natural disaster, it is critical that everyone receives the information they need to stay safe. However, reaching everyone can be challenging. If people are not signed up for an alerting service or are not near an area where a message is being broadcast, they could miss critical updates that impact their safety. That's why mass notification systems that offer Integrated Public Alert and Warning System (IPAWS) functionality can greatly extend the reach of messages.

IPAWS provides public safety officials (federal, state, local, tribal, etc.) with an effective way to alert and warn the public about serious emergencies. This functionality utilizes the Emergency Alert System (EAS) and Wireless Emergency Alerts (WEA) to broadcast messages.

FEMA AUTHORIZATION

Mass notification systems that use IPAWS can send alerts to WEA, which can reach any cell phone within a geographic area, and EAS, which allows users to set a screen crawl across TV screens for local TV stations. The goal is to provide organizations with the best possible opportunity to reach everyone with critical information. Utilizing these two methods helps extend the reach of traditional notifications beyond devices that are directly connected to a mass notification system.

The IPAWS functionality is different than standard mass notification methods as it requires approval from FEMA to use. Organizations using a mass notification system need to be recognized as an authorized Coordinating Operating Group (COG) by FEMA. This authorization is typically only granted to organizations involved with public safety, such as universities, police, sheriff, and state emergency management offices. Once authorized, a COG can use the IPAWS functionality to send Amber Alerts, Evacuation Notices, Shelter In Place, Silver Alerts, and other relevant emergency notices. Those alerts are typically limited geographically to only send to devices within the county the COG is located.

USING IPAWS

By default, the IPAWS functionality will likely be disabled within your system until your organization receives FEMA approval. Once activated, to prevent the accidental use of this feature, the process to trigger a notification is separate from the typical notification process. It is not connected to any other existing message templates or distribution groups a user may have configured within their system. Authorized COGs are also required to send a monthly test message to FEMA's training system which is provided as an option separate from a normal message. During natural disasters, this can be particularly effective in getting people's attention who might otherwise not receive the information.

Planning and Execution

How to Manage Unexpected Events

Before an Event

ANTICIPATE DISRUPTIONS

While we've walked through the information you'll need to gather to configure monitoring CAP feeds for automated natural disaster alerts, there is additional planning your organization can do to create the most effective response plan possible to deal with these events. This begins by gathering multiple departments to understand the types of events they are concerned about and the safety challenges they foresee as potential issues. The security team, facilities, HR, IT, and other managers will all bring different perspectives as to which events can cause the most disruption and how to best keep people safe.

DESIGNATE SAFE PLACES

One of the strategies stakeholders can have input on is designating safe places that can be included in instructions when alerts are sent out. The National Weather Service emphasizes that a person's location is a key factor in determining how much danger they are in. Your team can determine locations within or nearby your facilities and direct people to those areas in the event of a crisis. It's important to keep in mind that different situations may require different locations. A tornado may require people to go to the lowest level of a building, while a hurricane may call for evacuating the area entirely. Assess the different events you are likely to encounter and the best directions you can provide via mass notification.

DEVELOP CLEAR MESSAGING

Receiving input from these groups will also help determine the best way to build messages and groups so you can ensure the right messages reach the right people. It's important to include clear instructions in your messaging. Having a standardized template that can be altered or filled in when a natural disaster occurs helps keep messaging consistent and shortens the time it takes to send the message out. Messages should tell people where to go and what to do. This may require you to educate your people about different terminology when it comes to certain natural disasters, such as the difference between a "watch" and "warning" as it relates to severe weather.

MAP OUT EVERY STEP

It's important to keep in mind that natural disasters are often dynamic situations. The more comprehensive a plan you build, the better prepared you will be to handle an event, even if circumstances change. Mass notification systems with critical event management capabilities allow you to build out every step of your response, so you never miss a vital item on your safety checklist. This is also helpful if people unfamiliar with your system need to use it as it can guide them through every part of the process they need to complete. Building this before an event saves time when an event takes place and minimizes the risk of mistakes during chaotic moments.

In the next section, we'll walk through how you can best leverage mass notification should a natural disaster occur.

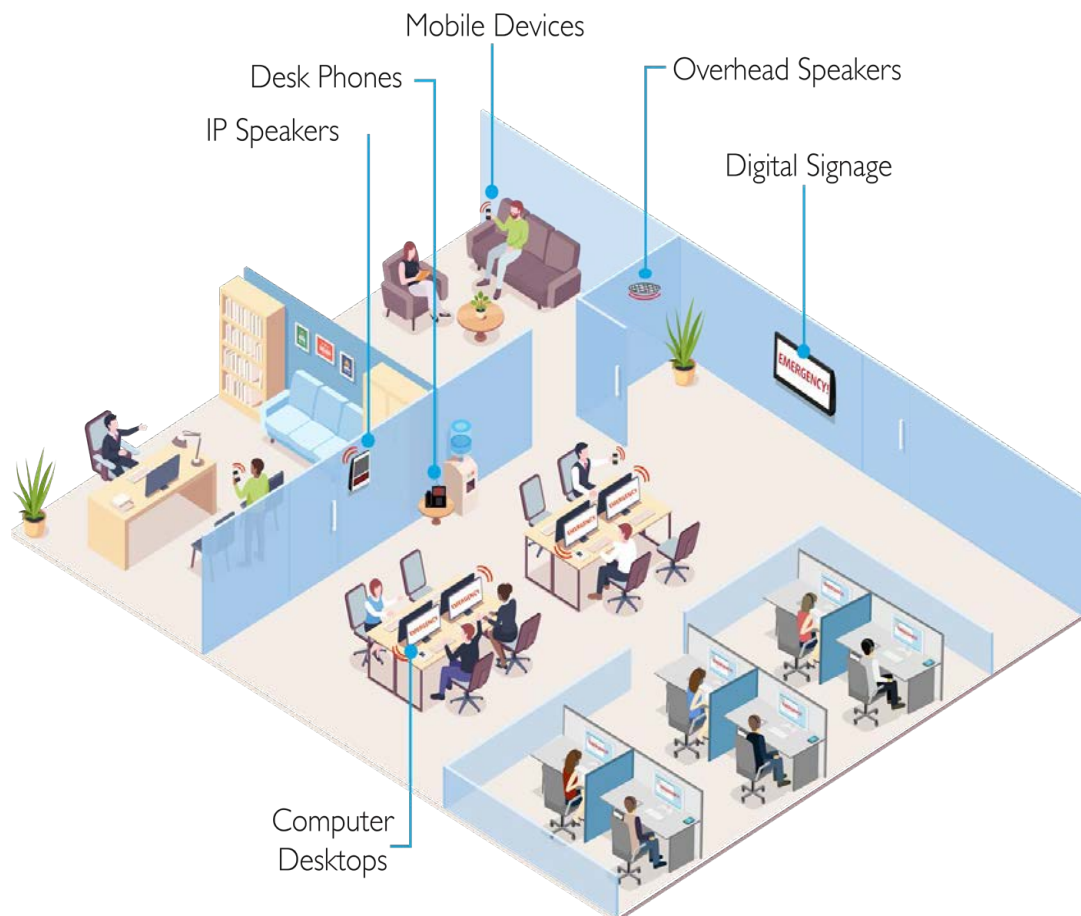
During an Event

TOOLS YOU CAN USE

With your messages and plan in place, mass notification systems offer many tools that you can deploy during a crisis to help ensure people's safety and an overall successful response.

DEVICE INTEGRATION

One of the biggest advantages a robust mass notification system can offer is integration with a wide range of devices to deliver messages. While many organizations rely solely on mass SMS text messages or email to share information during a crisis, these delivery methods have several issues that can make them ineffective, lack of immediacy being the most prominent. Email and text messages are passive forms of communication that rely on the recipient to be looking at the right device at the right time to receive the message. Natural disasters are urgent events that require intrusive messaging to capture people's attention and alert them to an issue. That's why the more channels and devices you can leverage, the more likely it is that you'll reach everyone in as short a time as possible. Mobile and on-site devices should be used to send text and audio messages. Mass notification systems that offer the ability to send simultaneous messages to cell phones, desk phones, desktop computers, speakers, and digital signage offer the best chance of reaching everyone.



During an Event (cont.)

CONFIRMATION RESPONSE

Once you've sent out initial alerts, you'll want to know that people have received messages and that they are safe. Given that natural disasters may cause people to seek shelter in the nearest safe place, you may not know where they are, which means you don't know if they are out of harm's way or need help. To help overcome this challenge, mass notification systems offer history reporting and the ability to send notifications that require a response. Following an initial alert, you can see if messages were delivered to all the people and devices you intended to reach, as well as if people read certain types of messages. For those that have not read alerts about natural disasters, you can send a follow-up message asking them to respond to a question. For example, the question could be "Have you evacuated? Reply with 1 for Yes or 2 for No." With simple response options, you can see results in real-time as they come in so you can identify how effective your alerts were, and who may still need help.

VIRTUAL COLLABORATION

In addition to integration with devices, some mass notification systems also offer integration with virtual collaboration tools like Microsoft Teams, Webex, and Zoom. Organizations can designate select team members to receive notifications with a link to join a virtual collaboration space. Given that people may be in separate locations, this offers a way to quickly gather key stakeholders who can assess a situation and determine the best course of action. This can also be helpful if an event is more catastrophic than anticipated. Organizations can gather the



right people to make decisions about how to alter their plans on the fly, and determine if additional messages are needed to communicate changes in operating hours, the need for people to stay away from damaged areas, or request help from staff to cover shifts.

These tools will help you manage an event as it unfolds. In the next section, we will discuss how to resolve an incident, return operations to normal, and plan for the future.

Resolving an Event

RETURNING OPERATIONS TO NORMAL

Once you are confident a threat has passed, mass notification systems can be used to help return operations to normal, assess how effective your response was, and make a plan for the future.

SENDING THE “ALL CLEAR”

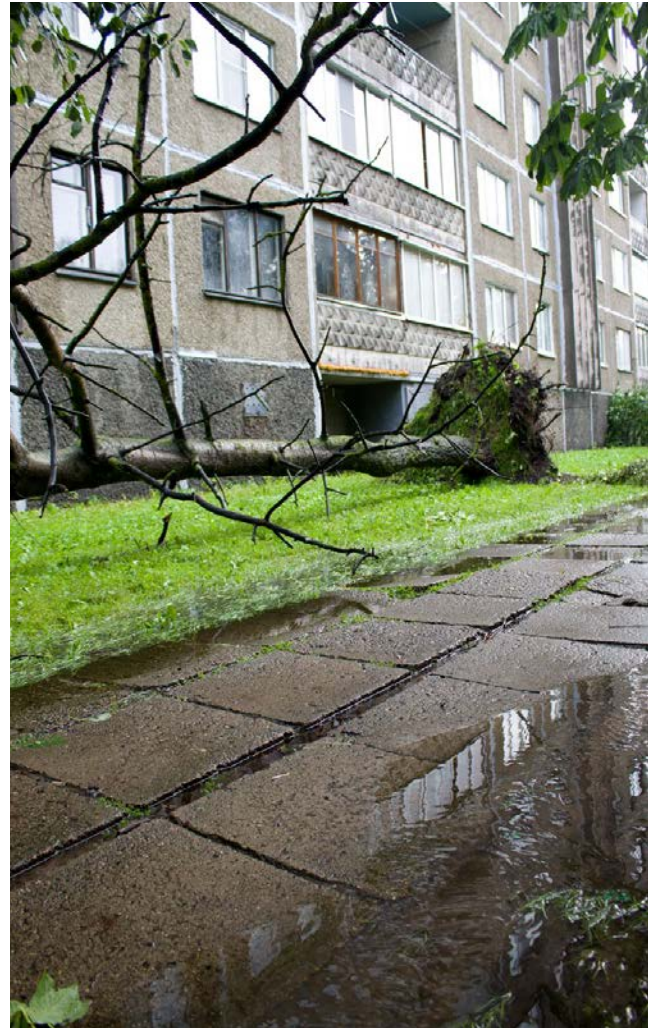
Using the same devices you used during a natural disaster, you can deliver messages to let people know it is safe to come out of where they are sheltering or return to your facilities if they have evacuated. In the same way using multiple channels help alert people about danger quickly, it can also get them back to what they were doing prior to the natural disaster. This minimizes downtime and the overall impact a disaster can have on your organization. You should establish clear criteria for how your organization will determine when an event has ended so messages are not sent out prematurely.

ASSESS YOUR RESPONSE

Following an event, some mass notification systems will automatically generate a report with details you can analyze to understand how effective your response was. This can include information about whether any devices or groups failed to receive a message, or if certain messages failed to activate. Using this report you can identify potential gaps in your response plan so no one gets left behind.

PLAN FOR THE FUTURE

Using your report can also help you plan for the future to identify the most effective strategies for sharing information and keeping people safe. While it can be hard to know exactly what issues you might have until you experience an event, running drills and conducting tests on a regular basis can help with recognizing potential issues and addressing them during calmer times.





Resources

Helping You Stay Prepared



Glossary

USING THE RIGHT TERMS

One of the most detrimental components of responding to a natural disaster is confusion. People don't understand what's happening or what they are supposed to do. This can put them in harm's way and make life more difficult for safety teams trying to address the situation as it unfolds. Using clear and accurate terminology when sending out alerts can go a long way in helping to minimize confusion. We've compiled a list of words and definitions so you can see the correct terminology in your communications.

TORNADO

The National Weather Service defines a tornado as a violently rotating column of air touching the ground, usually attached to the base of a thunderstorm. Some tornadoes are clearly visible, but rain or low-hanging clouds could obscure others. Tornadoes develop rapidly and may dissipate just as quickly. Most tornadoes are on the ground for less than 15 minutes.

THUNDERSTORM

The National Weather Service considers rain-bearing clouds that also produce lightning to be thunderstorms. They may occur singly, in clusters, or in lines and typically produce heavy rain for a brief period (anywhere from 30 minutes to an hour). Dry thunderstorms that do not produce rain that reaches the ground are most prevalent in the western United States. Falling raindrops evaporate, but lightning can still reach the ground and start wildfires.

BLIZZARD

According to the National Weather Service, a blizzard consists of blowing and/or falling snow with winds of at least 35 mph, reducing visibilities to a quarter of a mile or less for at least three hours. Winds lofting the current snowpack and reducing visibilities without any falling snow is called a ground blizzard.

SLEET

National Geographic describes sleet as tiny ice pellets that form under certain weather conditions, when a temperature inversion causes snow to melt, then refreeze. These pellets typically bounce as they hit the ground. Sleet can be dangerous, quickly coating the surface of roads and making driving hazardous.



Glossary (cont.)

HURRICANE

A hurricane, as defined by the National Ocean Service, can also be known as a tropical cyclone, which forms over tropical or subtropical waters. When a storm's maximum sustained winds reach 74 mph, it is called a hurricane. The Saffir-Simpson Hurricane Wind Scale is a 1 to 5 rating, or category, based on a hurricane's maximum sustained winds. The higher the category, the greater the hurricane's potential for property damage.



TROPICAL STORM

A tropical storm is a tropical cyclone that has maximum sustained surface winds ranging from 39-73 mph (34 to 63 knots).

FLASH FLOOD

Flooding that begins within 6 hours, and often within 3 hours, of the heavy rainfall (or other cause) is considered a flash flood by the National Weather Service. Flash flooding occurs so quickly that people are caught off-guard. Their situation may become dangerous if they encounter high, fast-moving water while traveling.

HEATWAVE

The National Weather Service defines a heatwave as a period of abnormally hot weather generally lasting more than two days. Heatwaves can occur with or without high humidity. They have the potential to cover a large area, exposing a high number of people to hazardous heat.

Glossary (cont.)

EARTHQUAKE

The USGS defines an earthquake as two blocks of the earth that suddenly slip past one another. The surface where they slip is called the fault or fault plane. An earthquake may include foreshocks and always includes a mainshock and aftershocks.

SHELTER-IN-PLACE

According to OSHA, "Shelter-in-place" means selecting an interior room or rooms within your facility, or ones with no or few windows, and taking refuge there. In many cases, local authorities will issue advice to shelter-in-place via TV or radio. Shelter in place orders can be necessary due to a wide variety of unsafe conditions located inside or outside a facility.

ADVISORIES, WATCHES, AND WARNINGS

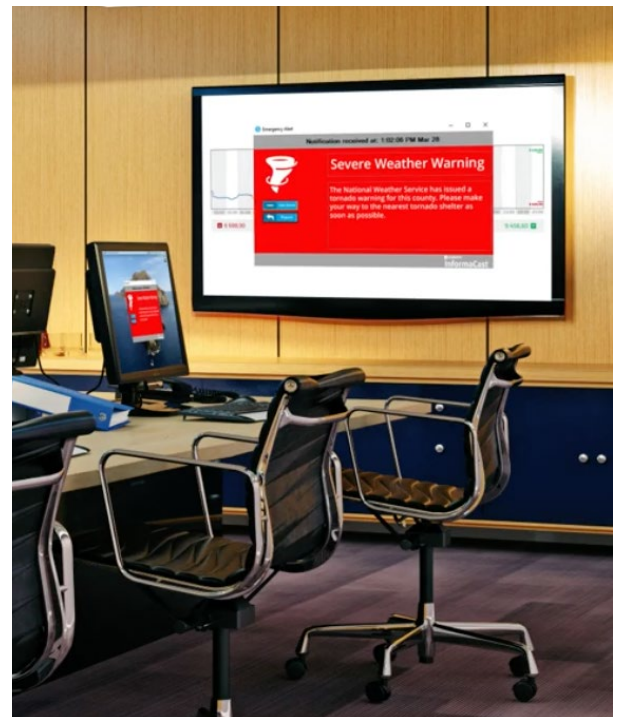
Different events can have different levels of severity, so it's important to understand what separates each. The following definitions are provided by the National Weather Service.

An **advisory** is issued when a hazardous weather or hydrologic event is occurring, imminent or likely. Advisories are for less serious conditions than warnings, that cause significant inconvenience and if caution is not exercised, could lead to situations that may threaten life or property.

A **watch** is used when the risk of a hazardous weather or hydrologic event has increased significantly, but its occurrence, location, or timing is still uncertain. It is intended to provide enough lead time so those who need to set their plans in motion can do so. A watch means that hazardous weather is possible. People should have a plan of action in case a storm threatens and they should listen for later information and possible warnings, especially when planning travel or outdoor activities.

A **warning** is issued when a hazardous weather or hydrologic event is occurring, imminent or likely. A warning means weather conditions pose a threat to life or property. People in the path of the storm need to take protective action.

This list of terms is by no means exhaustive and should serve only as a starting point to familiarize your organization with the terms and conditions that constitute different types of natural disasters. Consult with experts to understand what situations your organization is most likely to encounter and how to best communicate those details to your people.



Awareness Calendar

BUILD YOUR CALENDAR

Many groups exist to help protect people from natural disasters. These groups have designated windows throughout the year to help raise awareness about potentially dangerous events. During these windows, organizations are encouraged to educate themselves, run drills, and review their plans to ensure they are prepared should they encounter a threatening event. We have compiled a calendar to help you identify times throughout the year when you can review your response plans for different natural disasters.



**Note that all dates listed below are for 2022. Events should take place in a similar timeframe for future years.*

JANUARY

Volcano Awareness Month (USGS)

FEBRUARY

While no organizations sponsor a specific natural disaster safety awareness event this month, it is a good time to begin transitioning from winter to spring safety plans.

MARCH

Mar. 1: Spring Weather Safety (National Weather Service)



Awareness Calendar (cont.)

APRIL

Apr. 4–8: Tornado and Severe Weather Awareness Week (National Weather Service)

MAY

National Wildfire Awareness Month (Red Cross)
May 1-7: National Hurricane Preparedness Week (National Weather Service)
May 27: National Heat Awareness Day (OSHA)

JUNE

Jun. 1: Summer Weather Safety (National Weather Service)
Jun. 19-25: U.S. Lightning Safety Awareness Week (National Weather Service)

JULY

UV Safety Awareness Month

AUGUST

Aug. 15–21: Safe + Sound Week (OSHA)

SEPTEMBER

Sept. 1: Fall Weather Safety (National Weather Service)

OCTOBER

Oct. 20: International ShakeOut Day

NOVEMBER

While no organizations sponsor a specific natural disaster safety awareness event this month, it is a good time to begin transitioning from fall to winter safety plans.

DECEMBER

Dec. 1: Winter Weather Safety (National Weather Service)

In addition to these nationally recognized awareness events, states can also define particular natural disaster awareness days, weeks, or months. A full list of these events broken down by state is available from the National Weather Service.



Conclusion

Comprehensive Safety and Alerting Tools

Committed to Safety

PROTECTING PEOPLE AND PROPERTY

As a Weather-Ready National Ambassador for the National Oceanic and Atmospheric Administration (NOAA), Singlewire Software is dedicated to the NOAA's mission to save life and property by providing organizations with critical environmental intelligence. We support the NOAA in helping organizations to be ready, responsive, and resilient in the face of extreme weather, water, and climate events. WRN Ambassadors are formally recognized by NOAA as organizations committed to collaborating with NOAA, sharing preparedness messaging, and serving as an example of resilience best practices.

Our InformaCast mass notification and critical event management software is helping organizations across the country prepare for natural disasters that may impact their people and operations. With the ability to connect to CAP feeds from the National Weather Service, as well as earthquake warning tools, InformaCast can automate alerts to be sent the moment a threat is detected. Flexible customization options mean organizations can build messages for any kind of natural disaster they expect to face, and send messages to all of their on-site and mobile devices, ensuring no misses a message that may impact their safety.

OTHER EMERGENCIES

While organizations may need InformaCast to help with natural disaster preparedness, its capabilities extend well beyond that use case. InformaCast notifications can be customized for any emergency situation an organization needs to prepare for. From active shooter situations and medical emergencies to chemical spills and IT outages, InformaCast helps expand the speed and reach of your messages, so the right people get the right information as quickly as possible.

Have questions? Need more information? We're here to help you understand what you need to keep people safe and informed during natural disasters. Visit our demo page at www.singlewire.com/demo or contact a territory manager to discuss how InformaCast can fulfill your mass notification needs. Find more details at www.singlewire.com/contact-us, email sales@singlewire.com or call 608-661-1140 Option 1.



