

Inside the Unregulated, Patchwork World of Emergency Alerts

As wildfires, storms, and heat get worse and worse, they highlight our haphazard national approach to emergency alerts and warnings

By Colleen Hagerty

Soraya Sutherlin knew it was coming, she knew she was prepared, but still, her heart pulsed faster as the moment to push the button neared.

Sutherlin has worked in emergency management for more than 15 years, responding to mass shootings, wildfires, an oil-rig explosion, and the drawn-out disaster of the Covid-19 pandemic. She knows her "disaster personality," as she calls it, well. Her first instinct is always to flee, but she's trained herself to stay calm and, crucially, to stay put. She knows she can be good under pressure, and that's why she puts herself in this position, time and time again, to be the one responsible for telling people they're in danger.

Take a deep breath, she reminded herself, her inhales and exhales punctuated by the relentless beat of raindrops outside. She had work to do.

On Aug. 20, 2023, a tropical storm cut a course toward L.A., unleashing a downpour that broke daily rainfall records. Sutherlin, the alert and warning regional administrator for Alert SouthBay, spent days prepping, checking in with officials from the 15 cities that are part of the emergency-alerting program. They had drafted sample alerts based on the anticipated risks, messages that would warn people of flooding, to stay off roads, and where to look if they needed resources.



Now, as the streets became slick under the storm's heavy clouds, she combed social media and kept track of 911 calls — too many or too few signify danger, she says, with the latter often meaning cell service is down. She tried to stay calm knowing that at any minute the call could come, telling her it was time. Then, it would be up to Sutherlin to pull up those carefully crafted messages, adjust them accordingly, and hit "send," setting off a chorus of cellphone chirps and buzzes.

So — deep breath. No matter how much she planned, the moments before pushing the button were always stressful. There was the pressure to get the messaging right, but also to get it out fast, giving people the time to take potentially lifesaving steps.

"It sits on you like you are the individual that's responsible," she says. "It's not for everyone, and I've definitely seen people in those situations where they freeze."

Technology has transformed the way we experience extreme weather. You can track a storm on the news while dropping into a livestream on social media of someone recording the rain out their window. If it takes a turn for the worse, you might see a flashing graphic on TV, hear a dull warning tone on the radio, or drive past a digital billboard displaying up-to-the-moment alerts. And when the threat comes closer, wireless emergency alerts, or WEAs, allow people like Sutherlin to reach you directly, sending a free message that will ping cellphones in targeted areas. If you've received a message that looks like a text from some branch of government, it was likely a WEA.

In the 12 years since the U.S. federal government launched the WEA system, officials have issued more than 84,000 of these alerts. Between May and the end of August of this year alone, the Union of Concerned Scientists reported 100 percent of people living in the U.S. have been



in areas that received at least one extreme-weather alert. Researchers are looking into ways to get these notices on more platforms, from streaming providers to car consoles, and exploring how artificial intelligence can further improve this process.

Hurricane Helene's devastating and deadly imprint across the Southeast reminded us there are no "climate havens" — the best we can do is try to prepare. While it was clear Helene could cause catastrophic flooding, many in hard-hit inland areas say they did not receive adequate alerts. It can be challenging to send alerts out successfully in rural, mountainous regions due to connectivity issues. In the face of intensifying wildfires, storms, and heat, we are consistently confronted with the vulnerabilities of our daily lives: aging infrastructure, hazardously placed developments, and our haphazard national approach to emergency alerts and warnings, too.

When tornadoes swept through Rockdale County, Georgia, this past spring, residents complained they had little warning. There was a similar silence when Buffalo, New York, was buried in multiple feet of snow in 2022. In Maui, Hawaii, and Paradise, California — the sites of the two deadliest wildfires in modern U.S. history — survivors believe a lack of warning contributed to the loss of dozens of lives.

Each of these disasters was unique, but they also speak to shared, underlying issues that cut to the core of this system. Because when it comes to the who, what, when, where, and why of warnings, there's no single, official standard. Instead, there is a patchwork of approaches, often relying on a few people shouldering the responsibility to warn thousands or even millions of others. And while money, attention, and energy are being poured into addressing the technological side, the very human challenges of bureaucracy, communication, trust, and fear are often ignored — until the next disaster.



SIX YEARS AGO, the Camp Fire tore into the Northern California canyon that holds the town of Paradise, hot licks of flame chasing one another until thousands of buildings were ash and more than 80 people were dead. For many in the wildfire's path, official alerts never came — less than a third of Paradise residents received cellphone warnings. Most survivors say it was the sky that warned them, first darkened with smog and then lit with embers.

At the time, Paradise's approach to alerting was similar, if not more comprehensive, than other small, rural towns its size. Major cities like New York have dedicated emergency managers to deal with alerts, while smaller towns often rely on first responders like 911 dispatchers to both field calls and send alerts.

On a foggy Saturday morning last fall, Colette Curtis, recovery and economic-development director for the town of Paradise, recited a list of the warning systems the town had established before the Camp Fire. There were cellphone alerts, robocalls made to landlines, first responders going door-to-door, social media posts, and broadcasts disseminated through AM radio and local media.

"What we found in the Camp Fire is that sometimes all of the things fail when you have a disaster that is that large," Curtis says.

Researchers from the National Institute of Standards and Technology re-created a detailed timeline of the alerts that did go out that morning, matching them up with the movements of the fire. In some cases, bureaucracy and the chain of command slowed down the messages. At other points, the fire swallowed up power lines. This is a recurring issue — Maui County recently sued four major cell carriers for failing to communicate their outages to officials during the 2023



Lahaina fire, claiming emergency managers would have pursued other warning protocols if they were aware of the blackout.

Beyond the technological challenges, there were the high-stakes decisions to make in the fire's rapid approach. Paradise officials sent phone alerts through a software called CodeRed, which required residents to opt in. At the time of the Camp Fire, less than 40 percent of Paradise residents had done so. Officials decided not to also utilize the WEA system out of concern that too many people might receive the warning, including those who did not immediately need to evacuate. During a previous fire in the area, they had dealt with what Curtis describes as an "over-evacuation," which she says led to traffic jams and additional stress.

"Our thinking is much different now," Curtis says. "We think it's important people make that choice for themselves, so we have to give them the information."

To utilize the WEA system, officials must take one online training course, which largely focuses on how to operate the tech. After that, it's up to the local jurisdictions to determine how they use it, according to Wade Witmer, deputy director of the Federal Emergency Management Administration's Integrated Public Alert & Warning System Division.

"We find that the first time a lot of people ever thought about sending a message was in the middle of an emergency," says Rob Dale, a deputy emergency manager for Ingham County, Michigan. Dale is a niche celebrity, known for taking departments to task on X when they issue vague or poorly worded alerts. He runs his own employees through drills to practice using alerting software and craft messages for different hazards.



Sutherlin similarly requires the 450 Alert SouthBay participants to undergo quarterly training or risk having their accounts deactivated. Alert SouthBay works across jurisdictional lines, which is rare in the world of alerting. Sutherlin's goal is to get a message out within 15 minutes of learning about a disaster. If not, she says, people end up spreading unverified rumors, and officials are often left trying to counter misinformation.

Other emergency managers say that time frame would be impossible in their area. I hear from one emergency-management department head in an East Coast city who requests anonymity to speak freely about the challenges of the system. Before she sends a WEA alert, she needs approval from local elected officials, which can take hours.

"I think that's an emergency-notification shortcoming, especially in short-notice hazard areas," says Adam Chromik, a former San Francisco Department of Emergency Management staffer. "With a tsunami, where you have 10 minutes to get to higher ground, the logistics of trying to find everybody [to approve the alert] while also keeping everybody else safe is really challenging."

So first, there's making sure the technology itself exists and is operational when a disaster strikes. Then, there's having a person trained to "press the button" and navigate the steps that entails. And then, there's the actual content of the alert itself.

There are decades of research into what sort of messages motivate people to act during disasters. Jeannette Sutton, director of the Emergency and Risk Communication Message Testing Laboratory at the University of Albany, has been behind many of those studies. She can speak at length in the alphabet soup of government acronyms, and in her spare time, she analyzes WEA alerts for her website, TheWarnRoom.com.



"We need emergency managers to prioritize alerts and warnings, but I don't know where it gets prioritized in the scheme of the 500 other things they have to prioritize," Sutton admits.

She's trying to make it easier for them. Last year, Sutton and a team of researchers drafted a "warning lexicon" that offers suggested language for dozens of possible disasters. They have also created online best-practices training and a message-design dashboard for FEMA, which helps streamline the process of drafting warnings. The idea is to take the high-stakes guesswork out of staring at a blank screen in the middle of an already stressful situation. To date, Sutton says, nearly 800 emergency managers have taken the training, but it is only recommended by FEMA, not required.

While Dale praises the program, he expresses concern it would be tough for those who need it most — small-town operators juggling multiple roles during a disaster — to make time for optional training.

"People always think that when the time comes, 'I'll know how to do it,' " he says. "In the real world, it doesn't work like that."

JOSEPH TRUJILLO FALCÓN never knew the terror of a true thunderstorm until he moved from Lima, Peru, to Texas at age five. There, he saw "the sky explode," accompanied by an unnatural cry. It's a noise he now knows was a tornado siren, but at the time, it signified an unknown danger to him and his parents, who didn't have the English proficiency to follow along with the news.

"As I started to learn English, I actually became the translator for my own community," recalls Trujillo Falcón, now a distinguished postdoctoral research associate at the University of Illinois,



Urbana-Champaign. "Whenever a tornado warning would come out, I'd start sending text messages or calling friends and family, telling them in Spanish that this is what we need to do."

In the years since, Trujillo Falcón became a meteorologist and took on a role with the National Oceanic and Atmospheric Administration, focusing on multilingual alerting. Currently, the WEA system supports sending messages in English and Spanish. Private alerting programs like CodeRed offer more options. But the onus of translating alerts often relies on the capabilities of local offices. That can boil down to someone punching the message into Google Translate, which Chromik says can lead to some "pretty significant risks" of misinterpretation.

"The fact that we can watch our phone and watch our pizza being delivered, but we can't get a WEA message translated — come on, the capability has to be there," says Sheri Badger, chair of the Language and Accessibility for Alert and Warning Workgroup.

Badger works for the King County Office of Emergency Management in Washington state, which passed a law in 2018 requiring emergency alerts to be available in languages spoken by at least 1,000 residents. Where she works, that's 27 languages. When she researched how other cities approached translations, she was surprised to find that none seemed to have a "silver bullet" approach. So, she formed the group with more than 200 other emergency managers to reach underserved populations, including those who do not speak English or who have disabilities or special needs.

The Federal Communications Commission adopted rules in 2023 to make WEA messages available in more than a dozen additional languages, but the agency is still exploring how, exactly, to move forward with implementation. In the meantime, the lack of language accessibility continues to impact vulnerable populations. Veronica Robleto, director of the Rural



Women's Health Project in Northern Florida, says her organization translated alerts across six counties ahead of Hurricane Helene. They also simplified messages sent in Spanish that were difficult to understand.

Trujillo Falcón says cultural competency also needs to be taken into account when trying to reach broader populations. This includes considering how different dialects might change the meaning of messages or finding new ways to deliver messages.

"If you're really wanting to reach people, not only do you need to just put stuff on your website or on your Facebook page, but you also need to be proactive about posting or communicating through trusted messengers [and] through other forms of communication that people are already used to using, like WhatsApp groups," Robleto adds.

It also means acknowledging mistrust some have in the government. Robleto says they informed community members about police they could encounter at storm shelters and letting evacuees know they wouldn't be asked for identification papers. Concerns about trust were common in my conversations with emergency managers, particularly as faith in the U.S. government has sunk to record lows. Ahead of a nationwide WEA test last fall, social media was flooded with conspiracy theories about what the test was really going to do, from activating chemicals in our bodies to other means of forcing control over the population. While a study found 91 percent of adults received the alert, one in six reported having opted out of at least one type of emergency alert.

"Nobody trusted the government to begin with," Sutherlin says, "and then [Covid-19] happened, and they really didn't trust the government."



THE NEXT TIME a wildfire threatens the town of Paradise, there will be signs. Not just the natural ones — the rich scent of smoke or hints of orange haze — but physical ones sticking up from the ground. Earlier this year, the town put up street signs identifying evacuation zones, which are cited in evacuation warnings and orders.

If an evacuation is necessary, the town will also swell with sound, courtesy of the 21 sirens the town received FEMA funding to install. I joined Curtis from the town of Paradise for a test of the system, her office window cranked open to ensure we heard the siren stationed outside at full volume. At noon, a deep-voiced disclaimer interrupted our conversation: "This is a test of the Paradise early-warning sirens."

Then, the sounds began: a *weeee-wahhh* weeee-wahhh of alternating high and low tones for 30 seconds, similar to the cries of a particularly loud, unmoving ambulance.

The comments rolled in on the town of Paradise's Facebook page. The tones are too quiet, many agreed, impossible to hear indoors, impossible to hear from a mile away, impossible to hear when you have pets or kids or pots on the stove. Others heard them loud and clear and wouldn't change a thing.

Feedback — the good, the bad, the things you wouldn't repeat in polite company — is an essential part of the process, Curtis says. Based on the responses to surveys and on social media, Paradise added a second "scarier" sound, a classic air-raid tone that might conjure up World War II movies.

Wahhh-AAAHHH-oooh, this tone calls, a sound you feel in your stomach.



The signs and the sirens are both additive measures, designed to be used with all of the tools officials used during the Camp Fire. Sirens pose their own problems — they are costly to install and require regular upkeep and testing. To be effective, they require education, so residents understand what it means when they're activated, as well as what next step to take. They also rely on someone choosing to press a button. This was an issue in Lahaina, with officials deciding against sounding their sirens, claiming they were afraid residents would not understand they were for a wildfire and potentially end up deeper in danger.

But for Curtis, they are worth the extra effort. The signs, the sirens, the WEA, social media.

There's a saying in the "weather world," Dale tells me: "Layers save lives." It's an acknowledgment that no single system is perfect, and that disasters by definition are moments of systemic overwhelm. Even when they're predicted, the effects of extreme-weather events are often unpredictable, particularly as the <u>climate crisis</u> continues to widen the scope of possible scenarios.

Before leaving Northern California, I met with Maggie Krehbiel of Cohasset, another mountain town in the same county as Paradise. The small, unincorporated community is even more remote, with one road to get in or out and notoriously unreliable cell service. Over cups of diner coffee, Krehbiel walked me through her carefully curated emergency-alert plans. She had opted in for WEA and CodeRed alerts; she had downloaded WatchDuty, a popular app for tracking wildfires across the West; but she was most excited to tell me about the community-led radio network she and her neighbors created to exchange emergency information.

Seven months later, her preparations were put to the test. The Park Fire, a blaze that burned so large and hot it created its own weather, set its sights on Cohasset in July. Evacuees later



described the process as messy and terrifying, but no lives were lost, even as the fire destroyed more than 500 structures.

"These radios saved lives!" Krehbiel wrote to me after the fire, referring to both her community network and the county's radio dispatches.

But it wasn't just that — multiple layers fell into place, warnings reaching not just her radio but also her phone. It's proof that planning and layers can save lives — but that the planning can't start soon enough.