

Examining the debilitating effects of false alarms on citizen response to emergency warnings

An assessment by the National Weather Service (NWS) conducted in the wake of the devastating spring tornado that tore through Joplin, Missouri in 2011 identified the "desensitization" of the citizenry to emergency warnings as a primary factor in the high number of fatalities and injuries. While it may be impossible to calculate how many of Joplin's citizens heeded the warnings that preceded the tornado—and clearly many did — it is tragically apparent that far too many either dismissed the warnings until it was too late or ignored them altogether.

According to the NWS's research, the perceived frequency of false alarms certainly caused many Joplin residents to ignore the widespread media alerts that began being broadcasted as much as four hours before the storm reached Joplin, as well as the siren warnings that sounded approximately 20 minutes prior to the tornado touching down. In pointing out that less than one quarter of all tornado warnings are

eventually associated with an observed tornado, the NWS-Joplin study clearly focuses on the high incidence of false alarms as the reason why so many citizens fail to heed emergency warnings.

The findings of Federal Signal's 2012 Public Safety Survey, supports much of the research from previous post-disaster studies, including the NWS-Joplin assessment. The survey confirms that even the threat of severe weather does not provide sufficient motivation for many people to seek shelter. Joe Wilson, President of the Safety and Security Group of Federal Signal's Industrial Systems Division, notes that "...the survey results provide hard statistical evidence that supports the countless number of media reports and personal stories of tragedies that occurred because people simply failed to heed official emergency warnings, alerts and notifications."



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According to the Federal Signal survey, when it comes to taking action—despite receiving an official notification—just under one half (47%) of Americans would be motivated to take action during a warning of potential severe weather. The survey also records that 33% of respondents would require actual property damage or injury before taking a stronger stance with regard to public safety awareness, with one in 12 people saying nothing would cause them to care more. Finally, the survey indicates that more than one in four respondents (28%) would require confirmation of severe weather (i.e., actually sighting the tornado, rising floodwaters, wildfires, etc.) before taking protective action.

Past personal experience with tornadoes, hurricanes, tsunamis, floods, etc., is often cited as another reason why people fail to heed emergency warnings and evacuation notices. Since they have survived previous disasters, the tendency is to take inadequate precautions for the next one. In studying public response to hurricanes in Southern coastal states, Professor Hugh Gladwin of Florida International University (FIU) has collaborated on several research projects with social scientist and FIU emeritus professor Betty Morrow. Their work has consistently found that those people who have survived hurricanes in the past are less likely to follow evacuation orders unless they feel "a concrete personal sense of risk."

"There are many reasons why some people don't heed evacuation notices – some think they can ride out the winds and surging waters, while others simply have nowhere to go and no way to leave. Still others remember unnecessary evacuations from botched forecasts..."

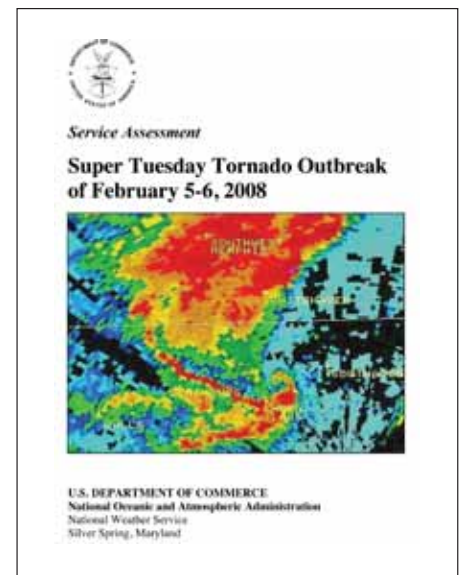
An article authored by Andrea Thompson in Live Science (September 15, 2008) reviewed the failure of many citizens of Galveston, Texas to comply with the evacuation warnings that preceded Hurricane Ike in September 2008. "There are many reasons why some people don't heed evacuation notices—some think they can ride out the winds and surging waters, while others simply have nowhere to go and no way to leave. Still others remember unnecessary evacuations from botched forecasts, and enter a 'boy who cried wolf' mentality." Nevertheless, the aforementioned Professor Gladwin suggests that in many cases inaccurate forecasting may have less impact on the decision not to evacuate than residents believing that they simply are not facing a life-and-death situation.

In another NWS Service Assessment entitled the Mother's Day Weekend Tornado in Oklahoma and Missouri, May 10, 2008, emergency managers often mention the word "fatigue" in ad hoc terms and phrases such as watch fatigue, warning fatigue, and siren fatigue. The constant use of the word fatigue has been interpreted to mean that the NWS issued too many watches or warnings during which no significant weather occurred.

More specifically, in addressing the issue of false alarms, the NWS Mother's Day assessment notes that despite peoples' knowledge that tornadoes do occur in their area, and their previous exposure to tornado watches and warnings, residents did not always personalize the threat. In other words, they often did not perceive themselves to be at serious risk based solely on a NWS watch or warning. Many of those interviewed, including emergency managers and other public officials, mentioned that they have been under numerous tornado watches and warnings where nothing happened.

Overall, much of the indifference concerning emergency warnings can be readily traced to the high incidence of false alarms that tend to desensitize the public. Beyond just outdoor sirens, these warnings can be initiated from a number of sources—everything from regional public safety agencies such as NWS, to television and radio broadcasts, to the severe-weather apps found in many of today's smartphones that too often seem to be issuing alerts on a near-continuous basis.

There has long been a concern about the many people who fail to attach a commensurate amount of urgency in responding to emergency alerts and notifications. This concern is also recognized in a third NWS study from 2009 entitled the Service Assessment of the Super Tuesday Tornado Outbreak of February 5-6, 2008. Here it is suggested that emergency warnings spotlight more definitive wording in order to elicit an immediate response during tornado outbreak situations. Designed to convey a greater sense of urgency to the dangerous and life-threatening risks posed by approaching severe weather, these alerts, which only recently went into affect, employ much more descriptive language, including words and phrases such as "unsurvivable," "mass devastation" and "catastrophic" to motivate the public to seek shelter. In the face of imminent and extreme severe weather, for instance, these new warnings urge citizens to take "immediate, life-saving action."



Among other suggestions that address citizens' complacent and apathetic views towards emergency warnings that result from false alarms is one from James Spann, the highly regarded television meteorologist from ABC's affiliate station in Birmingham, Alabama. Spann suggests on his blog that the NWS might cut down on the number of false tornado alarms by forgoing warnings for small spin-ups within a quasi-linear convective system (QLCS), commonly referred to as a squall line. He notes that these tornadoes rarely last more than a few minutes, and are virtually impossible to detect in advance. Additionally, they typically result in widespread, and somewhat less hazardous straight-line winds rather than tornadoes.

For the record, in an apparent attempt to counter the adverse affects of false alarms, the Emergency Management Agency for Alabama's Calhoun County no longer sounds its sirens for severe thunderstorms. Instead, the agency only activates outdoor sirens for tornado warnings and other non-weather-related emergency events.

The NWS Central Region Service Assessment Joplin, Missouri, Tornado—May 22, 2011 strongly emphasizes that GPS (global positioning system) technology and NOAA (National Oceanic and Atmospheric Administration) Alerts need to be more fully deployed. Not surprisingly, this recommendation focuses heavily on ensuring the full utilization of GPS across multiple agencies as a positive measure to increase the overall effectiveness of severe-weather emergency alerts and notifications.

While predicting and tracking the paths of hurricanes and tornadoes may never be described as an exact science, major technological developments have indeed improved the process dramatically over the years. In producing the assessment for the Super Tuesday tornado outbreak, NWS notes that this event marked the first time warning bulletins were storm-based rather than county-based. This represented a positive step towards reducing the geographic areas encompassed by severe-weather warnings, to both improve public responsiveness, and eliminate premature and misdirected alerts.

Nevertheless, despite the transition to warnings that emphasize forecasted storm tracks as opposed to arbitrary geographic boundaries, residents in locations relatively unaffected by the actual storm are oftentimes still included within the warning boundaries. This was exactly what happened across remote areas of Jasper County that were unaffected by the May 22nd tornado that swept through the metro-Joplin area in 2011. The need for narrower, more tightly targeted geographic alerts is also a significant contention of the previously cited FIU researchers.

No one would deny that 'it's better to be safe than sorry.' On the other hand, the research examining why so much of the general public either dismiss or ignore emergency warnings clearly concludes that

there are potential consequences to 'crying wolf,' not the least of which are needlessly panicking the population, and desensitizing the public to future emergency alerts and notifications.

"Geo-targeting can play an important role in defining more accurate and more compact geographic regions....and this ultimately results in better targeted emergency alerts," says John VonThaden, vice president and general manager, Alerting and Notification Systems, Federal Signal Corporation, which markets SmartMsg™, a network-based, multi-device communications software platform for emergency warning and mass notification.

"With software such as GeoSpear™, the ESRI-based GIS [Graphic Information System] app that was developed for the SmartMsg platform, EMs and public safety officials can send alerts and notifications to points on a map by just drawing circles, rectangles or free-form polygons. They can also select zip codes, towns, counties—even power grids and water supply lines—from pre-defined map layers," explains VonThaden.

County of Abbeville deploys GPS technology for more targeted alerts, improved citizen response.

The County of Abbeville, SC provides an example of a municipality that identified improved targeting of alerts as an effective means of eliminating citizens' hesitation when it comes to taking immediate disaster precautions. In 2007 the county deployed a Federal Signal SmartMsg™ mass citizen alerting system along with the GIS application to issue urgent alerts and notifications to precisely designated geographic areas as well as its first responders and specific members of its 25,000 citizens.

Relying on latitude-longitude coordinates, the Windows-based GIS console allows for specific addresses to be pinpointed so that alerts can be issued to all recipients within a defined radius of that point on the map. "This can be extremely valuable in emergencies where a very specific set of residents who, for sake of example, are in close proximity to a gas leak, and need to be notified immediately," says VonThaden, vice president and general manager, Alerting and Notification Systems, Federal Signal Corporation. "The message targets only those people who are affected--those that are directly in or near the path of a tornado, for instance. And no time is wasted notifying those who do not need to be notified, so the message reaches the intended audience sooner."

To view Federal Signal's 2012 Public Safety survey go to:
<http://federalsignal-indust.com/survey.asp>

To view the comprehensive Federal Signal white paper from which much of the material was drawn go to: TBD

For more information on Federal Signal SmartMsg network-based, multi-device communications software platform for emergency warning and notification go to:
http://www.alertnotification.com/SmartMsg_9451.aspx



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