

Why Lives are Lost in Severe Weather Conditions

Even though many lives are saved during severe weather, tornado, and hurricanes events due to the advanced warnings that are issued there are still countless lives lost. Why?

"The tornado that struck Joplin offers important lessons about disaster preparedness," said National Weather Service Director, Jack Hayes, Ph.D, in the [final report released by the National Oceanic and Atmospheric Administration](#) on the disastrous tornado that hit Joplin, Mo., on May 22, 2011.

"Tragically, despite advance tornado outlooks, watches and warnings, 159 people died and more than 1,000 were injured," Hayes continued.

Due to the EF-5 tornado that hit Joplin many people lost their lives even though they heeded the warnings and took the correct action. But there were many people who did not take action or made inappropriate decisions and lost their lives as a result.

The main reasons for loss of life were:

- Complacency
- The need for confirmation from multiple sources
- The "It won't happen to me" attitude
- Poor communication of the danger
- People not taking the right course of action

Complacency: When warnings are issued and little or no damage occurs, people may do not take warnings seriously and choose not to seek safe shelter or to evacuate from the danger area.

Need for confirmation from multiple sources: A conclusion was drawn from a National Weather Service (NWS) study that "people may require multiple sources of information throughout their decision-making process to assess their personal risk, and how a single source of information will not necessarily spur protective action."

"It won't happen to me" attitude: Studies have shown that many people have the perception that severe weather events always happen to "somebody else." For example, they understand that a tornado is ripping through their county, but they don't think it will hit their own house or since the hurricane always seems to move to the East, they are safe or the water will not really get as high as predicted.

Poor communication of the danger: As was the case in the Indiana State Fair concert stage collapse, warnings may be issued by the NWS, but authorities entrusted to pass the information on to the public may not appropriately convey the seriousness of the potential danger and energize people to take the appropriate action.

Not taking the right course of action: People may accurately perceive the warning and understand they are in danger, but they decide on the wrong course of action.

The 'It won't happen to me' attitude is a natural human instinct or feeling, but too often people do not consider the consequence of losing control of the serious situation. The field of meteorology continues to advance and the warnings and predictions are improving and becoming more accurate. The hope is that this will limit the issues of complacency.

But what can be done about the other issues mentioned? People will continue to not heed the warnings. The average lead time for major tornadoes in 2011 was 24 minutes. However, people continue to stay in mobile homes which are proven to be unsafe in tornadoes and hurricanes. People still get caught on the interstate highways.

Where are things going wrong?

According to the report "[Effective Disaster Warnings](#)" by the National Science and Technology Council and the Committee on Environment and Natural Resources, "warnings are effective only if they are accurate and result in appropriate action."

The following is an excerpt from the report:

"The warning response process is categorized into the following components:

1. Perceiving the warning (hear, see, feel)
2. Understanding the warning
3. Believing that the warning is real and that the contents are accurate
4. Confirming the warning from other sources or people
5. Personalizing the warning
6. Deciding on a course of action
7. Acting on that decision"

This indicates that the warning process is complex.

The report made key summaries about the effectiveness of warnings:

1. Warnings are most effective when delivered to just the people at risk. If people not at risk are warned, they will tend to ignore future warnings. Thus, if tornado or flash-flood warnings, for example, are issued for a county or larger region, but only a small percentage of the people who receive the warning are ultimately affected, most people conclude that such warnings are not likely to affect them.
2. If warnings that are not followed by the anticipated event are inconvenient, people are likely to disable the warning device. For example, if you are awakened in the middle of the night to be warned of several events that do not ultimately affect you, you are likely to disable the warning device.
3. Appropriate response to warning is most likely to occur when people have been educated about the hazard and have developed a plan of action well before the warning.

4. There is a window of opportunity to capture peoples' attention and encourage appropriate action. Studies of responses to tornado warnings, for example, found that those who sought shelter did so within five minutes of first becoming aware of the tornado warnings (Balluz et al., 1997)."

The NWS has also done studies on the societal impacts of warnings. In a [study done specifically on the "Super Tuesday" tornado outbreak](#) of 2008, it is clear that people put importance on "personalizing" the threat by seeking confirmation of a warning, most often either visually or by hearing sirens.

Another common issue highlighted by the study was people's perceptions of the danger. The Super Tuesday outbreak happened in February, a month many people perceived to be outside of the traditional tornado season. Many people also stood by the notion that "tornadoes always affect someone else."

A conclusion was drawn from the study that the Super Tuesday outbreak of 2008 "illustrates how people may require multiple sources of information throughout their decision-making process to assess their personal risk, and how a single source of information will not necessarily spur protective action."

What Now?

The NOAA understands the serious issue of the lack of response to warnings and has recently taken a new initiative to combat the problem.

The [new initiative to build a "weather-ready" nation](#) is outlined in a release on Aug. 17, 2011.

Social science is at the forefront of the "weather-ready" initiative.