



School Safety Monthly

March 2015

Natural Disasters

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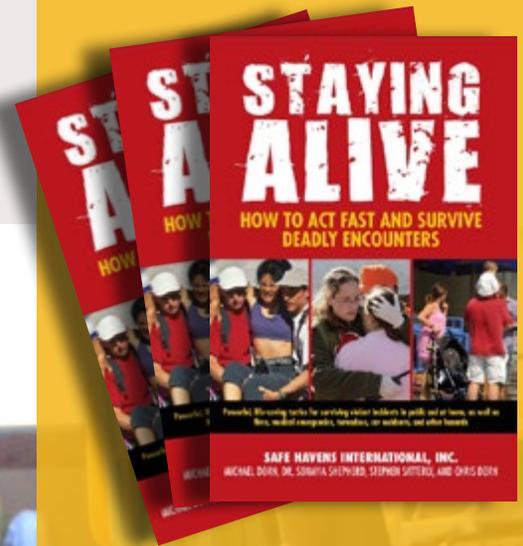
Photo: Rachel Wilson
Safe Havens International

Message from the Executive Director

With spring tornado season a concern to many school officials, we felt this month's focus on natural disasters was timely. We hope you find helpful information that can be applied to reduce the risk from the natural disasters that can occur in your region. - *Michael Dorn*

If you have any comments or suggestions on *School Safety Monthly*, contact us at www.safehavensinternational.org or on our Facebook page at [Facebook.com/SafeHavensIntl](https://www.facebook.com/SafeHavensIntl) or on Twitter via [@SafeHavensIntl](https://twitter.com/SafeHavensIntl).

School Safety Tools Highlight



Staying Alive

We have had excellent reviews for this powerful and timely book. The Indiana School Safety Specialists' Academy, the Maine Department of Education, the nation's largest charter school organization and numerous school systems have already placed bulk orders for *Staying Alive*. Contact us for quantity pricing information. Be sure to check out our free *Staying Alive* training videos [here](#).

For our online store, visit:
shop.safehavensinternational.org

Rachel Wilson / Safe Havens International



Earthquake Preparedness 101

by Stephen Satterly

Earthquake preparedness for schools may seem like a daunting task. After all, earthquakes would seem to be cataclysmic events that rapidly overwhelm a school's emergency response capabilities. There is some truth to that statement. School safety leaders need facts to discern the truth and to better prepare for the risk presented by earthquakes. Using a fact-based risk assessment and preparedness checklist can help school safety leaders in preparing for an earthquake while avoiding alarmism.

1. Assess the Risk

A critical skill for a school safety leader is to conduct a risk assessment to answer the question, "Are earthquakes a concern for us?" Next, ask "Is there data available on the risk?" If not, the risk may not rise to the level of action.

The U.S. Geological Service (USGS) has developed a National Seismic Map to illustrate earthquake risk for the 48 contiguous states. The map (shown on the next page) can be downloaded from:

earthquake.usgs.gov/research/hazrisk.

The red areas in California should come as no surprise, but some of you may be surprised at the red area in the Midwest. This area contains the New Madrid Fault which creates risk for earthquake in the Midwest. More detailed data on Hawaii and Alaska can also be

found at the USGS website. Alaska has the most earthquakes per year of any state; however, many of these are in rural uninhabited areas, and thus the level of risk is relative to population levels.

2. Prepare for the Risk

Preparing for earthquakes is based upon your response plans. Responding to earthquakes is done in two stages: during the quake and after the quake. ShakeOut has a website with excellent information on earthquake preparedness: <http://www.shakeout.org>

STAGE 1: During the quake

Earthquakes happen with little warning. You may hear a rumbling, or you may feel the ground or floor beneath you shaking, rolling, or buckling. You may see chandeliers or ceiling fans swaying and objects falling off shelves. During an earthquake, the generally recommended procedure is "Drop, Cover and Hold":

i. Drop

Immediately upon sensing an earthquake, drop to the ground. This moves your center of gravity closer to the ground and helps stabilize your position.

ii. Cover

Get under a desk, table, or anything within arms reach that can protect you from falling objects. If you are unable to find cover, use your arms to cover your head. Do not try to

run to cover as running will be very difficult and may lead to injury.

iii. Hold

Hold on to a table or desk leg or any object to help keep you as stable as possible.

STAGE 2: After the quake stops

After the ground has stopped shaking, it will be imperative to remove yourself from the building as parts or all of it may have been compromised by the earthquake. The standard evacuation protocol can be used for this purpose with some minor modifications:

i. Evacuate

Establish a safe route out based on the state of the damage to the building and potential hazards. This is a key time where alternate evacuation routes may need to be used since there may be rubble, fire, or utility damage blocking normal exits.

ii. Note the location of anyone who is trapped

As a school leader, your first priority should be to maintain your own safety. You cannot protect staff and students if you are not safe. Attempting an unsafe rescue can cause problems for students and staff who need you to be safe to help them.

iii. Retain accountability

As soon as it is safe to do so and you have taken other critical

steps, perform student accounting procedures and account for any visitors or other staff under your care. When first responders arrive, they will need to know how many people you have in your group, where any trapped people are, and how many people are missing. This will help them develop the best ad hoc response plan.

iv. Seek a safe area to assemble

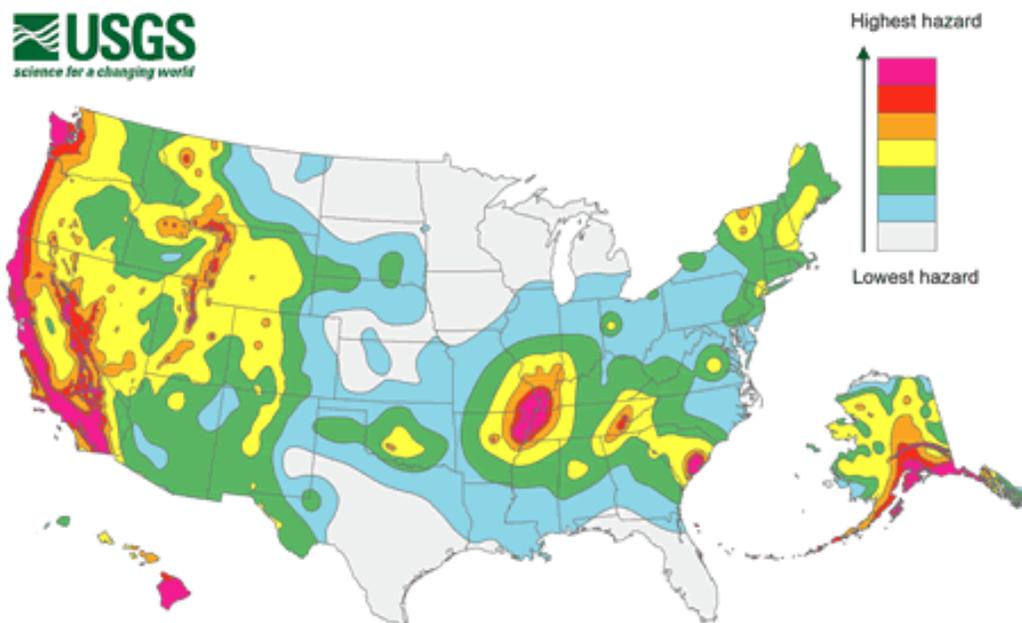
Earthquakes create wide-spread damage, so it is almost certain that help will not arrive quickly. Secure drinking water and food if possible. Avoid sheltering in areas near trees, power lines, buildings, or other tall objects as much as possible.

v. Communicate

As soon as you and those in your care are secured, contact public safety and school district personnel to let them know your status. They will be trying to communicate with parents and possibly the media. Keep your communications short and factual. Know that phone lines may be down as well as radio towers. In these circumstances, text messages may still get through. Have a plan in place to communicate in primitive conditions by using runners or other means.

In summary, earthquake preparedness is a straightforward process once you break it down into a risk assessment approach

and create appropriate emergency procedures. You may have local situations that require adding to or deleting from this checklist based on your unique level of risk. As with any emergency procedure, exercise your plan regularly. In our school safety assessments, we often find that earthquake drills are overlooked in the set of drills performed at the school level because of the low perceived level of risk. Because of the rare and unexpected nature of earthquakes, it is even more important to have a solid grasp of your earthquake procedures so that you can implement them quickly during a crisis. This is hopefully something you will never need, but if you do, you want the plan to work.



National Seismic Hazard map, 2014.

Source: <http://earthquake.usgs.gov/research/hazrisk/>

Shelter in the Storm: Where do We Go?

by Stephen Satterly

Springtime in the U.S. heralds the arrival of the major tornado season. It also heralds the age-old question for school safety leaders, “Where do we go for shelter in a storm?” The answer to that question comes from the Federal Emergency Management Agency (FEMA), and relies on the All Hazards approach to school emergency preparedness.

Risk Assessment

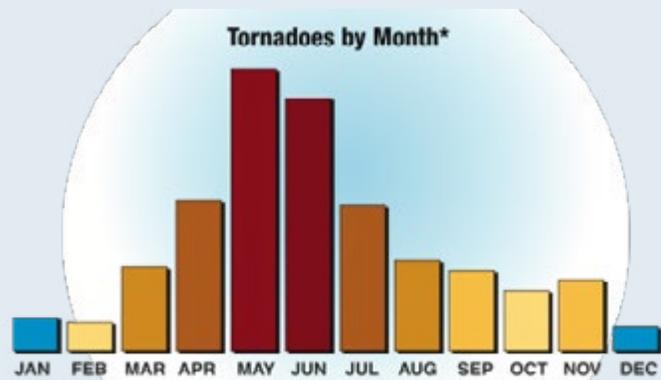
As with any other threat to your campus, the first step is to find out if tornadoes or severe wind events are a threat to your school. FEMA has created a resource that can help: [FEMA P-431](#).

Best Available Refuge

Few schools have FEMA approved tornado shelters. They offer near absolute protection from tornadoes up to EF-3 strength and enhanced protection from stronger tornadoes. [FEMA document 361](#) offers guidance for constructing these safe rooms as well as “hardened” areas to be used as shelter areas. Most schools, however, rely on “best available refuge” areas.

According to FEMA, a “best available refuge” area is an area in a building that has been identified by a qualified architect or engineer to likely offer greater protection during a severe wind event. Since they were not designed to provide protection in severe wind events, people sheltering in these areas may be injured or killed, but these areas are safer than other locations.

When do tornadoes occur?



* Data for Figures 1-1, 1-3, and 1-5 is based on Storm Prediction Center tornado data from 1986 – 2007. Statistics provided by Dr. Kevin Simmons, Professor of Economics at UI-Pan America.

Figure 1-1 Tornado occurrence by month in the United States.

The above chart shows the most critical months for tornado occurrences. Remember that tornadoes can occur in any month, but are more likely to occur from April through July. Also note that in the South, there is a secondary tornado season from October to November.

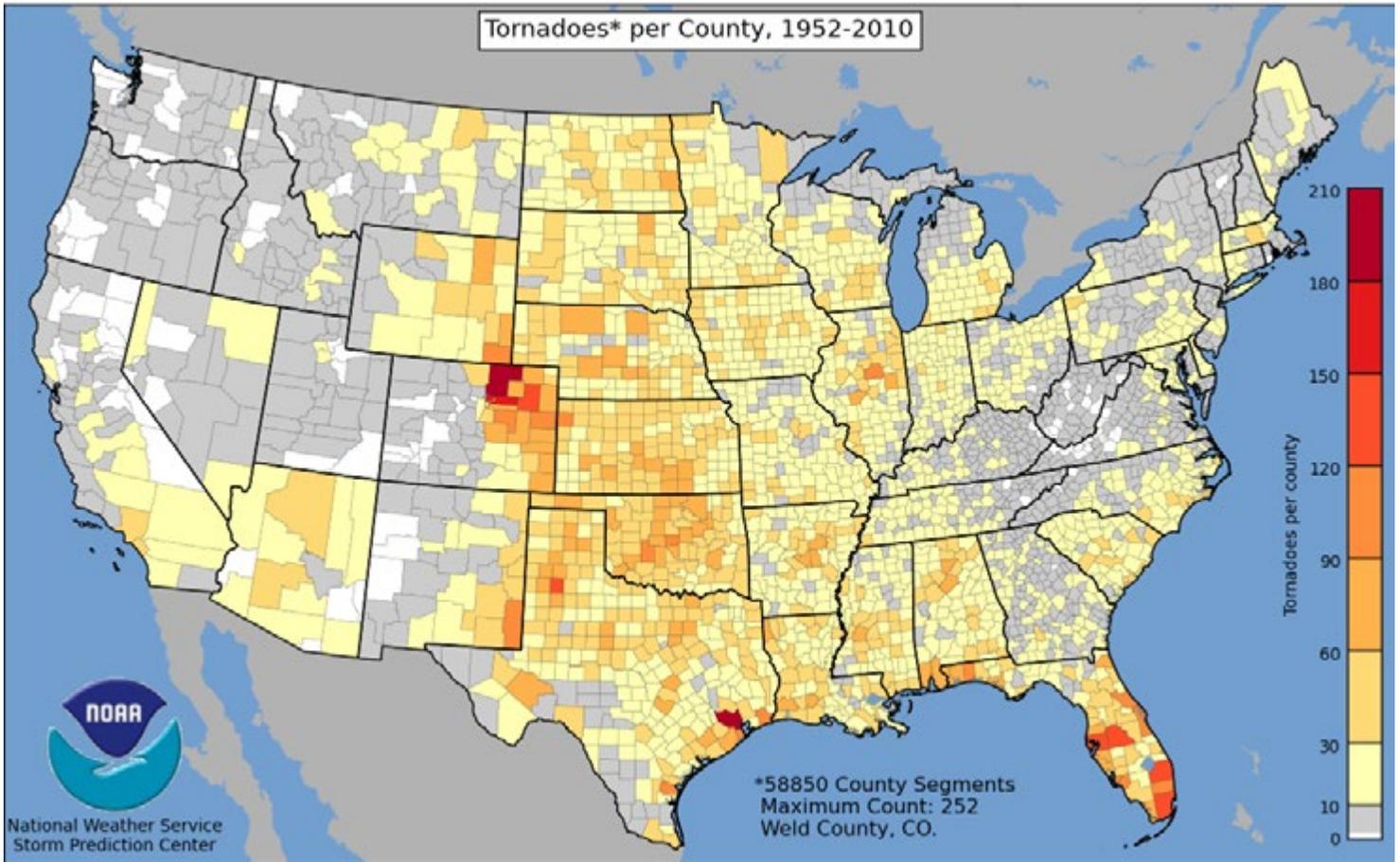
Source: NOAA

Steps to determining your shelter area:

1. Have a qualified architect or engineer assess your building, and identify “best available refuge” areas or your tornado shelter if your school has one.
2. Identify how many people need shelter. FEMA has determined that a person needs 2.5 sq ft of space to shelter. A person in a wheelchair will need 3.5 sq ft. Multiply the number of people by 2.5, add in the number of wheelchairs multiplied by 3.5, and you will have the square footage of refuge area you will need.
3. Compare the square footage of available “best available refuge” to the square footage needed. If you do not have enough refuge area, there is an issue that requires mitigation.



Where do tornadoes occur?



The above information is derived from historical data and National Oceanic and Atmospheric Administration data and shows the number of tornadoes that have occurred in each county between the years of 1952 and 2010. This is a very useful resource for school safety leaders. If your school is located in a region that has seen a large number of tornadoes, chances are good that one will occur again. It is also important to look at the magnitude of tornadoes that have taken place in your area, since a lower frequency of tornadoes can still create high risk if those that do occur are very powerful.



Hallways

After the destructive tornadoes in Joplin, MO and Henryville, IN, there was a movement to not use hallways as refuge areas during a tornado. This approach can actually increase danger to occupants because the hallway may actually be the best shelter area for that particular building. A school following FEMA's recommended approach may have identified the hallways as their "best available refuge." If that is the case, moving them from the hallways to another area of the building can actually increase the danger as they are moving to a less secure area for that specific building.



On May 20, 2013, Moore, OK was struck by a monster EF-5 tornado with some of the highest winds speeds ever recorded. Seven school children and a teacher were killed in the Plaza Towers Elementary School when a wall collapsed on them. The school is being rebuilt with a FEMA-designed storm shelter.

The upcoming tornado season puts thousands of schools at risk. While many schools do not have the resources to build such shelters, the above steps can mitigate against tornado damage in most buildings. The time and effort needed to do this are well worth the improved safety of staff and students.

Stephen Satterly, Jr. is a prolific writer and an adjunct analyst with Safe Havens International.

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