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## 1. ABSTRACT

Hazardous weather preparedness planning at the community, workplace, and individual household level should include the identification of a "Designated Weather Watcher." A Designated Weather Watcher is a person who remains aware of weather conditions on the behalf of others and takes action when there is a developing weather emergency to move people to safety.

Media reports, post-disaster assessments, and other case studies have highlighted and commended activities representative of a Designated Weather Watcher. However, the concept needs additional focus and integration into disaster planning to help reduce the number of people injured or killed while unaware of severe weather warnings in their area. Advancing communications technologies and upcoming improvements in the National Weather Service (NWS) severe weather warning products make the role of the Designated Weather Watcher easier and more effective.

This paper outlines the role of the Designated Weather Watcher in a hazardous weather action plan, discusses the benefits of such planning, and exhibits real-life success stories to underscore the effectiveness of the concept.

## 2. INTRODUCTION

The success of the public warning program depends upon people being vigilant and reactive. Despite the advances in severe weather detection, improvements in warning dissemination, and increases in warned lead-time for hazardous events, residents are still sometimes caught off guard.

The Designated Weather Watcher concept is rooted in common sense, and truly amazing cases of its use have been newsworthy in recent years. However, it still has not taken hold in mainstream business practice or everyday life. A Designated Weather Watcher is someone that is knowledgeable about severe weather preparedness concepts, committed to monitoring local environmental conditions when the weather is threatening, and able to usher coworkers, friends, and family to shelter when necessary.

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The views expressed are those of the authors and do not necessarily represent those of the National Weather Service.

Business operations, school activities, and social engagements cannot possibly enable every participant to be aware and prepared for severe weather. Most people are too busy to monitor the weather when they are immersed in the routines of daily life. However, the fact that injuries and deaths still occur during widely advertised severe weather outbreaks begs attention to this problem.

Having a Designated Weather Watcher as part of organizational plans for safety and operations continuity is not only important in terms of safety, it makes good business sense. Assigning a focal point responsible for monitoring severe weather and initiating emergency procedures to respond to an imminent threat is efficient and cost-effective. The rest of the workforce can maintain their productivity knowing their safety is being addressed. This concept is also appropriate for schools, sporting events, social events, and even individual households; the very same principles apply.

## 3. ROLE OF THE DESIGNATED WEATHER WATCHER

### 3.1 Designated Weather Watcher Responsibilities

A Designated Weather Watcher (DWW) remains aware of weather conditions on the behalf of others, so they can go about their business. When the weather becomes potentially hazardous, the DWW heightens his or her weather monitoring activities to remain cognizant of the threat to their specific location. In addition, the DWW knows how to initiate a local warning action to influence the actions of others when there is a developing weather emergency.

### 3.2 Integrating the DWW into Basic Preparedness Planning

The Red Cross, the emergency management community, and others in disaster preparedness encourage everyone to make plans for emergencies. Being prepared before disaster strikes helps minimize the impact as much as possible – whether it is from a flood, fire, blackout, etc. (Red Cross, 2006)

An important component of this planning is knowing how to stay informed of critical information and being able to react or respond quickly and appropriately. This is where the DWW comes in. The DWW assumes the responsibility for monitoring weather conditions and for initiating emergency actions when necessary.

It may be practical to associate the DWW role with others that already exist at the workplace or within a family. For example, the DWW may be the natural

focal point for monitoring the news during other non-weather-related hazardous events as well.

In certain settings, such as a large business or school, the DWW(s) should be directly identified in action plans, and their roles and responsibilities should be clearly communicated to others in the facility. This is important to ensure the DWW has the authority necessary to affect a rapid response and the tools and access needed for weather monitoring. Routine hazardous weather drills also help reinforce the DWW's effectiveness.

Effective planning means thinking through different scenarios, such as being caught in a vehicle during an emergency or somewhere other than at work, home, school, or other routine places. These must be flexible and tied closely to basic safety rules (AMS, 2000). For example, knowing to avoid the wind and debris during a tornado is critical, and this understanding should drive the actions of the DWW regardless of where they are when severe weather hits. However, as stated by the American Meteorological Society (AMS) Policy Statement on Tornado Preparedness and Safety, "Site-specific plans will promote efficient communication and allow for quick action," (AMS, 2000).

Action plans must also be specific for various hazards. A DWW may initiate procedures for taking shelter in a designated safe area/room during a tornado warning or may initiate an early release upon the issuance of a heavy snow warning.

Whenever possible, a DWW should maintain vigilance when outside of their normal routine. For example, if attending a special gathering (concert, sporting event, etc.), especially while a hazardous weather watch is in effect, the DWW should take notice of evacuation routes, maintain access to a source of current weather information, and inquire about the hazardous weather plan for the venue if possible.

This may sound like a big job, but with so many convenient sources of real-time weather information and options for mobile communications, it is easy to stay abreast of the latest information. Monitoring the weather does not have to be time consuming on a daily basis.

### 3.3 Daily Awareness

The simplest way to be an effective DWW is to make having an awareness of the weather forecast a part of the daily routine. This can be done in a number of ways depending upon an individual's preference for receiving information. Some may watch the weather forecast on television each morning before departing for work or school. Others may subscribe to an RSS\* feed or otherwise add a weather source option to their homepage on the Internet. In any case, having quick

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\* RSS refers to a family of web feed formats. A content provider publishes a feed link on their website which end users can register with an aggregator program. Web feeds notify users of new content without having to actively check for it.

access to the daily weather forecast provides the DWW with the opportunity to take note of the possibility of hazardous weather conditions in their area as far in advance as possible.

The NWS warning program uses a multi-tiered approach designed to increase public awareness and responsiveness to an impending hazardous weather event. This structure provides a natural progression of information, which is ideally suited for the responsibilities of the DWW.

The first step in the multi-tiered process is the *outlook*. An outlook is used to indicate that a hazardous weather event *may* develop. Outlooks are intended to provide adequate notice to those who need considerable lead-time to prepare for an event. (NWS, 2005)

An outlook is often followed by a *watch*, the next phase of the multi-tiered concept. Watches are used when the risk of a hazardous weather event has increased, but its occurrence, location, and/or timing is still uncertain (NWS, 2005). The watch represents the point at which anyone in the affected area should have an increased awareness of the local weather conditions and should be monitoring changes carefully.

### 3.4 Heightened Awareness during Potential Severe Weather Days

During days with the potential for hazardous weather, particularly as identified in an NWS outlook or watch product, the DWW should monitor the weather more frequently for updated information. Not all events are preceded by an outlook and/or watch though, so it is important that a DWW has an alerting device to ensure they receive any warnings issued for the local area.

The DWW should also have redundancy in their warning reception capabilities. Some options are NOAA All Hazards Weather Radio with battery backup, television, AM-FM radio, Internet, amateur radio, or even a radio frequency scanner. Some jurisdictions also disseminate text message warnings, which may be received by computers and mobile communications devices through a subscription service.

In the workplace, this duty may be performed ancillary to others by someone with easy access to the Internet and a NOAA Weather Radio. At home, it may mean keeping the television on in the background on a local station known to carry emergency alert messages or checking other weather sources with some frequency. The key is paying attention when the potential for severe storms exists.

*Advisories* and *warnings* are issued when "a hazardous weather event is occurring, is imminent, or has a very high probability of occurrence," (NWS, 2005). This is the final phase of the multi-tiered concept. A warning is used for conditions posing an immediate threat to life or property, and an advisory is for conditions that may threaten life and/or property (NWS, 2005).

### **3.5 Taking Action**

When an alert is received, the DWW should take immediate action. Depending on the situation, this may involve seeking additional information about the impending weather event. For severe thunderstorms and tornadoes in particular, the geographic references in the warning products should be particularly helpful, as are the threat polygons displayed on television and certain mobile devices. Environmental clues are also important; although they may appear benign and misleading during certain events, such as flash floods.

The planning and preparedness activities accomplished in advance should make this step nearly automatic. The DWW should invoke established procedures to move people to safety, whether through activating an alarm and making an announcement or simply asking your family and dinner guests to move to the basement. Again, the key is applying basic safety rules to the situation, regardless of the location or circumstances.

## **4. BENEFITS OF HAVING A DESIGNATED WEATHER WATCHER**

### **4.1 Saving Lives**

The benefits of having a DWW in terms of safety are clear. Monitoring weather information during potentially hazardous conditions to ensure every minute of lead-time for an impending hazard can be utilized to the fullest is the goal. The average lead-time for a tornado (i.e., the amount of time between the issuance of the warning and the tornado occurs) is 14 minutes (NWS, 2006). In most cases, this is enough time to take appropriate shelter, but every second counts.

There are countless examples of individuals acting in a capacity consistent with a DWW and taking action to save lives during extremely hazardous weather events. A good sampling is presented here.

On July 13, 2004, an F4 tornado ripped through the Parsons' Manufacturing Plant in rural Woodford County, Illinois. Although the plant was destroyed, no fatalities or injuries occurred among the 150 persons in the plant. They had been ushered into storm shelters according to the severe weather safety plan and due to the efforts of a DWW (Miller et al, 2005). A similar favorable outcome resulted on May 3, 1999 when an F4 tornado struck the Norland Plastics Plant in Haysville, KS (Leslie, 2002).

On November 10, 2002, an F4 tornado swept a 53-mile path through Van Wert County and Henry County, OH. Remarkably, no one was killed when the tornado struck the Twin Cinemas in Van Wert. The theater manager had received the tornado warning and directed movie-goers into the restrooms for safety (DOC, 2002).

On June 6, 2005, strong winds from a severe thunderstorm ripped the roof from the kindergarten wing of Charles F. Johnson Elementary School in Endicott, NY (Katcher, 2005). The school received the alert on NOAA Weather Radio and officials activated their

severe weather action plan which included moving the 340 students to designated refuges (Katcher, 2005). Again, no injuries occurred as a result of this storm. Similar successes were noted at Jones Valley Elementary School during the November 15, 1989 tornado in Huntsville, AL (DOC, 1990) and at Mize High School in Smith County, MS on April 5, 2005 (AP, 2005).

In addition to these well-documented cases, many post-storm assessments and news stories contain accounts of life-saving measures taken by individual family members during severe weather. In all of these cases, whether they realized it or not, people were acting as Designated Weather Watchers. Assessments also suggest that some severe weather deaths may have been avoided had a DWW been in place.

On March 27, 1994 (Palm Sunday), an F3 tornado grazed the Goshen United Methodist Church in Cherokee County, AL. Tragically, 20 people died and 90 were injured when the roof collapsed on the congregation. The Weather Forecast Office in Birmingham issued a tornado warning for the area about 12 minutes before the tornado struck the church, and a tornado watch had been in effect for several hours, but no one at the church was monitoring the weather (DOC, 1994). A NOAA Disaster Survey Team, in cooperation with local officials found that an interior hallway that remained intact could have provided adequate shelter for all 150 occupants (DOC, 1994).

### **4.2 Economic Benefits**

In addition to the obvious safety benefits, the DWW concept makes good business sense. Assigning a focal point responsible for monitoring the weather and initiating emergency procedures to respond to an imminent threat enables the rest of the workforce to maintain their productivity knowing their safety is being addressed.

Every warning should be taken seriously, and sheltering takes time. Research has provided an estimate of the costs related to sheltering during tornado warnings. In 2002, 186 million person hours were spent under a tornado warning in the United States (U.S.), and the value of this time was about \$3 billion (Sutter, 2006).

The average false alarm rate for tornado warnings in the continental U.S. is 74% (NWS, 2006). These warnings are currently county-based, and the NWS plans to implement storm-based warnings that will reduce this warned area considerably.

This upcoming improvement in warning precision makes the role of the DWW that much more useful. The geographic depiction of the warning area for a severe thunderstorm, tornado, or flash flood will be delineated to represent only the area immediately threatened – not the entire county. Accordingly, a DWW will have additional information upon which to determine whether their location is at risk. Enabling people to remain productive while a knowledgeable person is keeping a close eye on the local weather conditions takes full advantage of the improvements in the precision of short-duration severe weather warnings and

will reduce the costs associated with unnecessary sheltering.

## 5. CONCLUSION

Disaster planning efforts and preparedness activities should include the identification of a Designated Weather Watcher. Many types of disasters can occur with no advanced warning at all. Fortunately, some hazards, such as tornadoes and flash floods, are often warned for with several minutes of lead-time. Whether at home, at work, or somewhere in between, having a DWW ensures that every second of that lead-time is used to move people to safety.

Perhaps the simplest way to be an effective DWW is to integrate a basic awareness of the local weather conditions into the daily routine. The DWW can take advantage of the NWS' multi-tiered warning approach to maintain their awareness. Then, when the potential for severe weather exists, the DWW monitors the weather more frequently and is responsible for activating emergency procedures if necessary.

## 6. REFERENCES

- American Meteorological Society (AMS), 2000: Tornado Preparedness and Safety Policy Statement, *Bull. Amer. Met. Soc.*, 81, 1061-1065.
- American Red Cross, 2006: Get Prepared. Retrieved September 10, 2006, from [http://www.redcross.org/services/prepare/0,1082,0\\_239\\_,00.html](http://www.redcross.org/services/prepare/0,1082,0_239_,00.html)
- Associated Press (AP), 2005: Violent Weather Hits Mississippi: Storms Cause Damage and Injuries. Retrieved July 30, 2006, from [http://wcbstv.com/topstories/topstories\\_story\\_096152203.html](http://wcbstv.com/topstories/topstories_story_096152203.html)
- Barker III, L., C. Miller, and E. Quetone, 2005: The July 13, 2004 Parsons Tornado Event: The Contribution of Evolving Paradigms and Human Factors in the Warning Process. *2<sup>nd</sup> Midwest Extreme and Hazardous Weather Conference*, Amer. Meteor. Soc., Oct 14-15, Champaign, IL.
- Katcher, M., Timely NOAA Weather Radio All Hazards Warning Helps Save Children at New York Elementary School, *NOAA News Release*, NOAA 05-R276. Retrieved July 30, 2006, from <http://www.publicaffairs.noaa.gov/releases/2005/jun05/noaa05-r276.html>
- Leslie, J. 2002: NOAA Weather Radio: For Anytime Severe Weather Strikes. Retrieved September 10, 2006, from <http://www.publicaffairs.noaa.gov/grounders/nwr.html>
- Miller, C., L. Barker III, D. Eastman, and K. Coulter, 2005: The July 13, 2004 Roanoke Illinois Tornado Event: The Warning Response Process at the Parsons Company. *2<sup>nd</sup> Midwest Extreme and Hazardous Weather Conference*, Amer. Meteor. Soc., Oct 14-15, Champaign, IL.
- National Weather Service, 2005: WFO Winter Weather Products Specification. Retrieved September 10, 2006, from <http://www.weather.gov/directives/sym/pd01005013curr.pdf>
- National Weather Service, 2006: Stats on Demand Severe Weather Verification Software, Internal software program. Retrieved September 10, 2006, from the National Oceanic and Atmospheric Administration.
- Sutter, D., and Simmons, K., The Value of Tornado Warnings and Improvements in Warnings. Presentations at the *American Economics Association Annual Meeting* (Boston, January, 2006), and the *American Meteorological Society Annual Meeting* (February, 2006).
- U.S. Department of Commerce (DOC), NOAA., 1990: *National Disaster Survey Report, The Huntsville Tornado, November 15, 1989*, (pp45-46). Silver Spring, MD: U.S. Government Printing Office.
- U.S. Department of Commerce (DOC), NOAA, 1994: *National Disaster Survey Report, Southeastern United States Palm Sunday Tornado Outbreak, March 29, 1996*, (pp29-30). Silver Spring, MD: U.S. Government Printing Office.
- U.S. Department of Commerce (DOC), NOAA, 2002: *Storm Data and Unusual Weather Phenomena with Late Reports and Corrections*, (pp101). Asheville, NC: National Climatic Data Center.