Severe Weather Awareness

English 314 Proposal

2010

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Situation

On the afternoon of May 25, 2008, an EF5-rated tornado devastated the Iowa towns of Parkersburg and New Hartford. This tornado was the first EF5 in Iowa since 1976. (Des Moines, IA, Weather Forecast Office) The storm brought with it 205 mile per hour winds, a path a mile wide, and longevity that carried it 43 miles. Unfortunately, 9 people in Parkersburg and New Hartford lost their lives that day or in the ensuing weeks and months after the tornado. The majority of victims heard that the storms were coming, but did not have enough time to prepare. One victim did not know at all, but was asleep when the tornado hit her town. ("Remembering the Victims")

Not long after this incredible tornado crushed Parkersburg, another outbreak proved deadly. A group of severe thunderstorms moving across northwest Iowa and southwest Minnesota on June 11, 2008, produced a total of 64 tornadoes ("SPC Storm Reports…") killing multiple victims, including 4 teenagers at a boy scout camp in Iowa. They heard sirens and took cover before the tornado hit, but their shelter did not quite suffice.

Sadly, severe weather claims the lives of 629 people every year, with tornadoes contributing to 57 of those deaths per year ("NWS Weather Fatality…"). This may be due to insufficient preparation, not enough time to reach shelter, or not knowing the severe weather is approaching. Better communication might be the answer to these problems, but we first need to understand what goes into detecting severe weather (particularly thunderstorms and tornadoes) and informing the public of the threat of severe weather.

The National Weather Service (NWS), part of the National Oceanographic and Atmospheric Administration (NOAA), dedicates themselves to providing forecasts and warnings related to weather, hydrology, and climate in order to preserve the life and property of the American public. ("Mission Statement") In addition, the Storm Prediction Center (SPC) provides more in-depth watches, warnings, discussions, outlooks, and analyses of severe weather, both past and present. Stations can warn their viewers that they believe that severe weather is present, but they do not actually produce the warnings. They provide information and insight to the NWS, who then issues the warnings.

Many people misunderstand the meanings of "watch" and "warning," and therefore may not take the proper safety measures for the weather situation they experience. Below are explanations of each term, and a short description on how meteorologists issue watches and warnings.

> **Watch:** Meteorologists issue weather watches if a significant risk of severe or hazardous weather exists, but the timing and location of the event is uncertain. Watches provide people with the time they need to formulate a plan if severe weather actually occurs, and head to a safe place if they are in an area vulnerable to severe weather. See the large, red polygon below in *Figure 1* labeled "Watch".

Warning: A severe weather warning, on the other hand, indicates that some hazardous or severe weather event is occurring at that time or is imminent. Warnings advise people in the path of severe weather to take evasive action immediately. See the small, red polygon below in *Figure 1* labeled "Warning".
(Boise Weather Forecast Office)

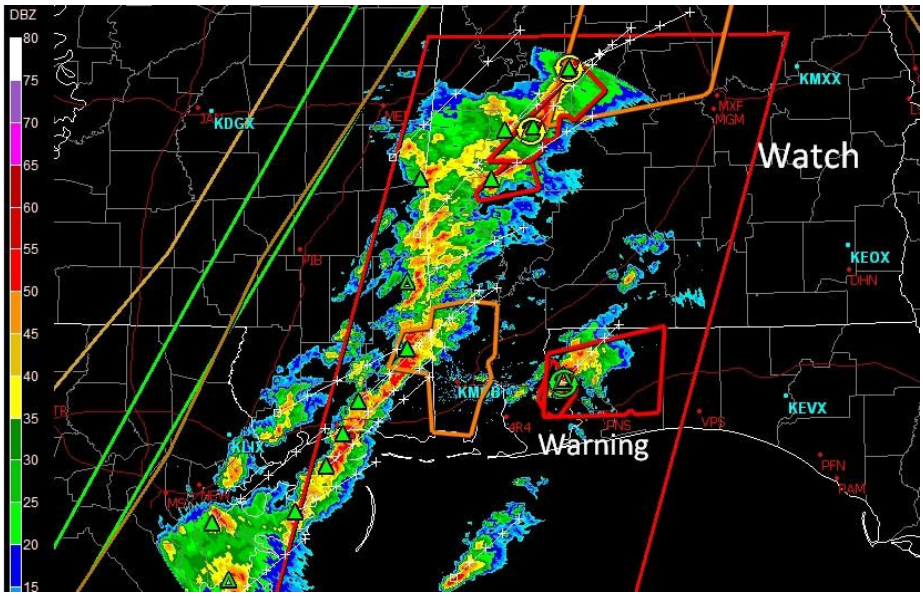

Figure 1: Watches and warnings on a radar map

How does the public know when watches or warnings have been issued? The following are common means of communication during severe and hazardous weather.

Television is a major mode of communication regarding severe weather. Local news stations or weather stations keep the public informed on watches and warnings. News stations may even make the weather story their top priority, over other news stories. In addition to news and weather stations displaying weather news, many television channels now show small maps in the corner of the screen, outlining areas targeted for watches and warnings. Viewers do not have to tune in to the news or weather to know about potential severe weather.

Weather radios are one of the best ways to stay up to date and informed about severe weather watches and warnings. Weather radio broadcasts come from the National Weather Service offices. In general, the radios inform listeners of forecasts for farming, travel, fishing, etc. However, in the event of severe weather, they immediately broadcast the watch or warning for the area. Most radios are programmable, so the listener can choose only to hear news about severe weather. This is incredibly helpful, and is more reliable than television or internet information. A weather radio can stay with the listener throughout a severe weather event because they are operated by batteries as well as electrical power. Weather radios also broadcast information of environmental

hazards such as oil or hazardous material spills, and public safety announcements such as AMBER alerts. (“What watches and…”)

Civil defense sirens, easily recognized, are mounted on buildings or tall poles and emit extremely loud tones that warn everyone in the area of some crisis. Sirens may be used to indicate air raids, fallout, an attack of some sort, fire, or (in tune with this proposal) tsunamis or tornadoes. While sirens are useful during the daytime, they are especially useful at night when tornadoes are unexpected and people are sleeping.

Currently, the National Weather Service and local weather organizations make efforts to education the public and train weather spotters to be severe weather informants. The NWA’s StormReady program, formed in 1999, aids America’s communities in preparing for severe weather by teaching them communication and safety skills needed to preserve lives and property. StormReady encourages advanced planning and awareness and strengthens local safety programs. (“NWS StormReady Program”)

SKYWARN is another part of the NWS’s goal to monitor severe weather and preserve life and property during such weather. SKYWARN trains locals to spot severe weather and inform their Weather Forecast Offices. Overall, this helps the NWS to issue more accurate and precise warnings for severe weather. Anyone who has an interest in public safety is welcome to train as a spotter and provide eyewitness information to the NWS in times of severe weather, especially thunderstorms and tornadoes. (“NWS SKYWARN”)

When it comes to severe weather, many people are not well-informed. This may be caused by both a lack of communication from the government agencies as well as lack of education of the general public. If the public were better informed as to what weather-related terms mean and how they work, they would be more likely to listen to things the NWS, SPC, and NOAA announce, as well as follow instructions for staying safe in severe weather.

Plan

Our plan begins with an initial survey discussing watches, warnings, safety information, and means of communicating that severe weather is afoot, such as tornado sirens and weather radios. We will then proceed to create flyers and a webpage containing the information that everyone should know about severe weather preparedness and awareness. The flyers and webpage will include all the information a reader would need to answer the questions in the survey, plus other interesting information and safety tips. As part of the American Meteorological Society, ISU Chapter, there is a possibility that we can add our webpage to the AMS online site, to make it easily located, accessible, and credible. We will post the flyers around campus in well-travelled areas, and publicize the webpage link so that people can read the severe weather information. Finally, we will conduct a post-survey to gauge if our information had any effect on students around campus. Using the information from the surveys, we can calculate how effective our project was and plan better programs in the future.

Benefits

There are many benefits to improving communication between government agencies and the general public. The biggest benefit of this project would be saving the lives of innocent bystanders. If the general public has a better understanding of the watches and warnings issued by the National Weather Service, they can be better prepared and protect themselves and others. We also plan to make known some of the programs that the National Weather Service and NOAA have available for the public that aid in preparing the public for severe weather. To be more specific, below are the benefits of individual parts of our project.

Fliers

If we were to pass out fliers covering the information that every person should know about severe weather, people could be better informed and help protect others around them. Also, fliers are useful pieces of paper to keep handy during severe weather so that people have easy access to specific details relating to things broadcast by the National Weather Service or a weather radio. In the fliers, we would promote weather radios, so if more people have radios they are more likely to know when severe weather is imminent in their area.

Website

There are many benefits to having a website, even without any other informational material. A website is an excellent reference for information. They are also easily editable as information evolves and changes. Websites are easily accessible to anyone with Internet, and since we are in a very technological age, that is easy to come by. A website can also demonstrate things that a flier possibly would not, such as videos on programming a weather radio.

Surveys

If we pass out surveys before and after handing out fliers and creating a website, we can guarantee that people are getting the right information from our fliers and website. By doing an initial survey, we can see exactly where the problem areas lay and make parts of the flyer and website more specifically directed toward trouble areas or unclear areas. The post-survey will tell us how well we educated the public with our fliers and website. It will also show us areas of information that we did not emphasize enough, so that we can adjust the website and possibly print more fliers as necessary. The final flier will ensure that people know what they need in order to stay safe.

Approach

We plan on splitting this project fairly evenly between the three of us. There is just enough to do so that the workload can be spread out between multiple people. Setting date deadlines will help us keep the project moving.

April 13th, 2010

- Sam finishes preparing the survey questions with the help of Liz and Ryan

- The survey is put on SurveyMonkey and e-mails are sent out to students so that they can take it until April 16th

April 17st, 2010

- Survey results are evaluated to see what information is important for the flier and website

- Liz finishes the outline for the flier

- Ryan finishes the general web layout and design

April 20th, 2010

- The final draft of the flier is finished and ready for printing

- A version of the website is available online to the general public

- The post-flier survey questions are finalized

April 21st, 2010

- The post-flier/website survey are sent out

April 27th, 2010

- Post survey results are evaluated

April 30th, 2010

- Changes to the website are finished based on results from the survey

- Final project is due for class

In addition to a schedule, we have a proposed budget for the project based on prior experience and company websites. I have included possible quotes for a printing service for the fliers, webspace expenses, and other possible expenses.

ITEM		PRICE (APPROX)
Website		
Webspace	$	90.00
Hit Counter	$	-
Time and Effort	$	-
Flier		
Paper	$	10.00
Printing	$	150.00
Time and Effort	$	-
Surveys		
SurveyMonkey Account	$	100.00
Time and Effort	$	-
TOTAL	$	350.00

Evaluation

In order to know that our previous steps made any effect we plan on taking two actions. First we will have our target sample retake the survey and, from that, see if their knowledge improved. Our second criterion for evaluation will be to see how many unique hits the website received after publication. Both of these will be weighted at the same level in terms of importance.

Retaking Survey

The survey questions mainly contained non-opinionated questions in which the person taking the survey needed to know basic information regarding severe weather awareness. A very clear and obvious way to see if our sample learned the information is to have them take another quiz-like survey and see if improvement is present. The questions will be different, but at the same level of difficulty as the initial survey. Some questions near the end may be more difficult, just to see if our sample learned more than anticipated.

Once the surveys have been taken, we will conduct a statistical analysis comparing the final survey to the initial survey. Through some sort of test we will determine if statistical significance is present, and from that evaluate ourselves. For now, we will say any level of significance below a p-value of .10 will be of significance. We will once again use SurveyMonkey as our survey engine.

Website Counter

Our website will be published within the next month and, as with any new website, we have to worry whether or not it is being used. One way many websites see if they are getting visitors is to install a hit counter. A hit counter basically counts the number of people that have visited our site through basic JavaScript. This is what we will also do prior to the publication of the website.

One worry is that many repeat visitors will come back, thus misleading our hit counter. Instead of just a basic hit counter, we want to install a hit counter that only records unique hits. This will eliminate any repeat visitors, including ourselves. The coding for this will be much more difficult in that it will need to read in IP addresses and store that information to a file. This is certainly possible and will be of great use to us.

If even a hundred unique hits occur during our first month we will be happy. It is going to be very difficult to get this site known early. The use of the <meta> tag to help search engines find this site will be needed, but it must be stressed early on that little interest, most likely, will be immediately shown on the website. If we have a little over thirty people, we know that our survey sample was interested, and that in itself is a victory for us.

Qualifications

Our team consists of three meteorology majors all with different levels of education, experience, and expertise. All three of us are involved heavily in the local chapter of the American Meteorological Society, in which we do tasks that help the public learn about severe weather. For instance, over the last few years we have printed basic severe weather awareness information on Hy-Vee grocery bags and placed them in local stores. We are all of at least junior status and involved in various other meteorology activities in the areas of forecasting, public outreach, and broadcast. Even though we are not of professional status, we still have been through many spotter training talks and lectures regarding this exact information. We are more than qualified to teach severe weather awareness to the public.

Elizabeth Suess

Elizabeth is a junior in meteorology and loves studying severe weather. Growing up afraid of storms, she understands how very important communication with the weather service can be. She has gone storm spotting several times, which requires a very in-depth knowledge of the difference between watches and warnings and what the different wording means. Her expertise within meteorology is in broadcasting, which requires a great deal of communication with the public. Combining this with her love of severe weather, she is very knowledgeable in explaining how things work in a simple manner that a typical American would understand.

Samantha Santeiu

Samantha is a second-year student in meteorology with a concentration in computational mathematics. She chose to attend Iowa State for meteorology because of

her love of severe weather and the outdoors beginning at an early age, as well as her proficiency in math and the sciences. When lightning hit the house behind hers when she was small, Samantha learned quickly the dangers of severe weather. She has since taken steps to educate herself about severe weather. She participated in many local programs concerning weather in her hometown, including spotter training, before she attended college, and has since attended more advanced spotter training talks at ISU, as well as the Central Iowa NWA Severe Storms and Doppler Radar Conference. Samantha is interested in severe weather, lake-effect weather, and climatology and will hopefully gain greater experience with weather patterns during her studies this summer.

Ryan Alliss

Ryan is a senior in meteorology and is very passionate about severe weather. The main reason why he decided to go into meteorology was because of his love of severe weather that was passed on down to him from his dad. By the time he was in college he had already attended two spotter training talks, one that was deemed the advanced talk. In college he was given the opportunity to be a part of the professional storm chase research team, TWISTEX. On TWISTEX, he got to chase storms across the country in order to get data for research on tornadogenesis. He is well aware of the dangers of these storms and has seen firsthand the effects. His expertise in meteorology lies in the area of forecasting, more specifically the forecasting of severe weather.

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