Alabama Severe Weather Awareness Week

2008

Anywhere, anytime...

March 1, 2007 EF4 Tornado Enterprise, Alabama

are you ready?

An Annual Educational Effort Sponsored by

National Weather Service

Alabama EMA Emergency Management Agency

American Red Cross

Russell Corporation

Midland Radio Corporation

Mercedes-Benz

Printed as a public service for the citizens of Alabama

Severe Weather Awareness Week in Alabama
February 17 - 22, 2008

Sunday, February 17 through Friday, February 22, 2008, has been proclaimed Severe Weather Awareness Week in Alabama by Governor Bob Riley. During this special week, Alabamians are encouraged to learn and/or review the proper safety precautions necessary for protecting their lives during severe weather.

Throughout this week, the National Weather Service, Alabama Emergency Management Agency, and American Red Cross chapters in Alabama will be conducting educational activities to help people learn how to prevent injuries and deaths from lightning, wind, hail, tornadoes, and floods. Media outlets are encouraged to promote this week through articles, stories, and interviews to acquaint people with severe weather dangers and the proper safety precautions necessary for survival.

This booklet contains material on severe weather and ways to prepare for it. Lightning, wind, hail, tornadoes, and floods ALL pose great danger to Alabama. Weather related disasters do occur annually from these phenomena. After nearly every weather disaster, the story is the same; people survived because they knew what to do! By taking a few minutes to learn or review severe weather safety procedures, you could save your life or someone else's.

Alabama EMA officials cooridinating efforts with the fedreal, state, and local agencies after the tragic tornado outbreak on March 1, 2007.

National Weather Service Meteorologist monitors the RADAR during a severe weather event.

Photo courtesy of the Birmingham Chapter of the American Red Cross.

Contents

Acknowledgements

Front cover photos were taken of the March 1, 2007 Enterprise EF4 tornado damage of the Enterprise High School and President George W. Bush offering support to the victims of this tragic event. The photos are courtesy of Danny Tindell and Jay Hare of the Dothan Eagle.
Back cover photo was taken by Barry Mott of the EF4 Tornado as it moved through Enterprise, AL on March 1, 2007.
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Additional booklet input and contribution provided by NWS offices in Birmingham, Huntsville, Mobile and Tallahassee and Brian Peters of the Alabama SKYWARN Foundation.

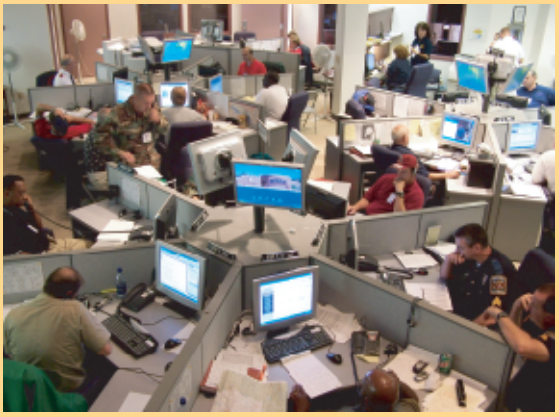
Messages from the National Weather Service and Alabama Emergency Management Agency

The tragic events of March 1, 2007, including the devastating tornadoes at Enterprise and Millers Ferry, again show that severe weather can strike anywhere and anytime. Our hearts go out to the families that were affected by this tragic event. As you read the information in this brochure, I hope you are compelled to develop a disaster plan and practice it. Many people did have a plan, practiced it, and put it into action during this day. By doing so, many lives were spared.

First and foremost, ensure you can receive severe weather watches and warnings. Do not depend solely on outdoor warning sirens because you may not hear them indoors. Get an indoor siren, which is a NOAA Weather Radio All Hazards. Know what to do when a warning is issued, no matter where you are. You and I can not stop severe weather from occurring, but we can take action to develop a plan, practice it, and protect ourselves and loved ones as much as possible.

Jim Stefkovich, Meteorologist-in-Charge
National Weather Service, Birmingham

Almost one year after the 2007 severe weather season, portions of the state are still working to rebuild and return to life as they knew it before the dangerous and deadly March 1, 2007 tornadoes. Nearly one week prior to that event, the Alabama Emergency Management Agency and the National Weather Service encouraged Alabamians to be prepared for the threat of tornadoes during the primary severe weather season. This year we offer the same message because we know the impact and devastation that tornadoes can have on our lives, families and communities. As an agency we want the families within our 67 counties to know AEMA is prepared to assist you with each threat this state may face. Just as we prepare, we encourage you at home to have a plan and do the same. The theme this year is "Anytime, anywhere…are you ready?" That's what we want the residents of Alabama to ask themselves before the next disaster strikes.



Alabama EMA Operations Center located in Clanton, AL

John D. James, CEM
Acting Director, AEMA

Special Thanks to Our Partners

To recognize their commitment to public service and safety, the National Weather Service extends a special thanks to those contributing to the 2008 edition of the Alabama Severe Weather Awareness Week Booklet:

Severe Weather Awareness Week in Alabama is an annual public awareness campaign to draw attention to severe weather preparedness. Since its inception by the National Weather Service following the April 3-4, 1974, super-outbreak of tornadoes, this week has been observed each year as part of a continuing commitment to improve severe weather awareness. The National Weather Service has traditionally led this campaign, but additional partners have joined to improve and expand this effort to reach Alabamians with this important information.

April 8th - Living Alabama History

A recount from members of the NWS Staff who forecasted, worked, and surveyed the event

During any severe weather event, things move fast. As storms progress, we issue warnings and communicate with the media and emergency managers, all in an effort to provide the best information possible. We hear of damage, but at the same time, our mission is not over. How fresh is the staff? Too much time looking at the radar or writing warnings tends to cause fatigue. Roles are changed periodically, and extra people are called in to make sure we have a pool of people to cover the myriad of tasks we need to perform.

Oak Grove High School

This year marks the 10 year anniversary of the April 8, 1998, tornado outbreak. While other parts of this booklet deal with facts and safety, we wanted to relate some of the human aspects of our jobs to this severe weather outbreak.

Before the event, the atmospheric signals were there for Alabama to be ripe for severe weather. On April 7, the Storm Prediction Center placed most of Alabama under a high risk for the next day. First, we had to make sure we communicated the threat in National Weather Service outlooks and forecasts. While being sensitive not to over warn people, we also have to balance the information emphasizing the rare high threat conditions.

On April 8, 1998, as the day wore on, there was the doubt that the conditions may not materialize as we first thought, since the storms to our west had not fired up. By mid afternoon, the first storms got going in east central Mississippi and the fear of over hyping subsided. Severe weather reports in Mississippi started to come in as conditions became increasingly more dangerous over Alabama. Get ready, here it comes.

While we had confirmed reports of a tornado on the ground in Tuscaloosa County, our attention focused on the classic tornado radar signature that was moving from eastern Tuscaloosa County into Jefferson County, right toward the largest city in the state. While still performing the job, one can not help but think that people's lives will be disrupted by these storms. Lives, homes, and possessions are all at risk. While we do not know all the faces, we know that a large number of people will be impacted. Our biggest fear that day was that the most significant storm was headed toward the center of Birmingham and the Birmingham airport. Little did we know at the time, that it was an F-5 tornado!

After about five to six hours of intense weather, the storms moved into Georgia around 9 PM. We had issued a total of 86 severe thunderstorm and tornado warnings. We knew we had a major event, but until the tallies came in, we didn't know how extensive the damage was. In the end, three powerful tornadoes had crossed central Alabama. There was damage of some sort in nearly every county. Thirty-two Alabamians lost their lives, over 250 were injured, and nearly 2000 homes were destroyed or significantly damaged.

The next day, the personal aspects of the storms hit hard as we conducted post storm surveys in communities such as Oak Grove, Pleasant Grove, Edgewater, McDonald's Chapel, and Pratt City. Talking to emergency managers and survivors, and seeing the damage and the lives affected, one got a whole different perspective of what the radar indicated a day earlier. While every severe weather event is devastating to the people it impacts, the impacts of an F-5 are the most dramatic. Seeing homes leveled for blocks, wiping out neighborhoods, is something no one is ever ready for.

While you may have never personally been touched by the adverse affects of weather, there is not any part of Alabama that is safe from severe weather. Always be alert for severe weather warnings, and be ready to take action to protect you and your loved ones. Remember, the victims of the April 8, 1998 outbreak were never expecting to be victims that day either.

2007 - Alabama Year in Review

the numbers

Davenport (Lowndes, Co.), March 1, 2007

Warnings Issued for Alabama by the National Weather Service :

Tornado Warnings 306 (223 in 2006)
Severe Thunderstorm Warnings 680 (1038 in 2006)
Flash Flood Warnings 101 (108 in 2006)
Total 1087 (1369 in 2006)

Miller's Ferry (Wilcox, Co.), March 1, 2007

During 2007 in Alabama, tornadoes, thunderstorm wind damage, severe hail, and/or flash floods were reported on 75 days. The number of severe weather days decreased by 11 compared to 2006. The following is a list of each day that any place in Alabama received one or more of the severe weather events mentioned above.

January 5 - W
January 7 - TWHF

February 13 - TWHF
February 24 - WF

March 1 -T WHF

April 1 -F
April 2 - H
April 3 - TWH
April 4 - W
April 10 - H
April 11 - TWH
April 14 - TWHF
April 26 - W

May 2 - H
May 3 - H
May 11 - WH
May 12 - H
May 13 - WH
May 16 - W
May 30 - F

June 5 - WH
June 6 - H
June 7 - W
June 8 - W
June 9 - WH
June 11 - WH
June 12 - WH
June 13 - H
June 14 -WH
June 15 - W
June 18 - W
June 19 - TWF
June 24 - W
June 25 - W
June 26 - W
June 27- WH
June 28- WH
June 29 - WH
June 30 - W

July 1 - WHF
July 2 - W
July 4 - F
July 6 - F
July 7 - W
July 9 - WH
July 10 - W
July 14 - W
July 20 - WH
July 23 - W
July 25 - WHF

August 1 - W
August 3 - WH
August 10 - W
August 14 - W
August 17 - WH
August 18 - W
August 23 - H
August 24 - WH
August 25 - WH
August 27 - W
August 29 - F
August 30 - W
August 31 - W

September 7 - W
September 14 - W
September 21 - T

October 18 -THW
October 19 - WF
October 22 - TW
October 23 - TW

November 13 - WH
November 22 - W

December 15 - F
December 20 - WH
December 28 - H

T - tornado, W - thunderstorm wind damage, H - severe hail, F - flash flood

OTHER SIGNIFICANT WEATHER

The National Weather Service does not issue special warnings or statements for lightning because all thunderstorms contain dangerous lightning. In 2007, there were 20 reports of structural damage caused by lightning. Across the state, 12 people were injured from lightning strikes. In Monroe County, a man was killed while working outside. In Dekalb County, nine cattle were killed when lightning struck a nearby field.

Lack of spring time rains created statewide severe drought conditions by the end of March. As less than average rainfall continued through the end of the year, much of the state experienced water restrictions and agricultural stress. With rainfall deficits greater than 20 inches in most locations, exceptional drought conditions continue. See the Extreme Alabama Drought Page, page 5, for more information.

An unusually late freeze across portions of North and Central Alabama on April 7-8 gave way to record heat in the month of August. The late freeze damaged millions of dollars of crops, while August became the warmest month on record. Unfortunately, 15 Alabama residents died from heat related illnesses last summer. Another 690 sought medical attention at area hospitals.

Forty-two tornadoes were reported on 11 days in 2007 (compared to 70 tornadoes on 10 days in 2006).

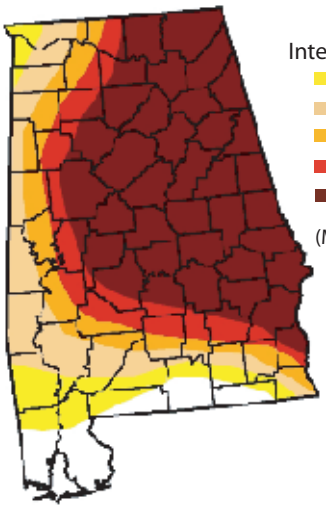
Thunderstorm wind damage was reported on 59 days (compared to 69 days in 2006).

Severe hail was reported on 36 days (compared to 51 days in 2006).

Flash floods were reported on 15 days (compared to 16 days in 2006).

The Extreme Drought of 2007

The year 2007 will be remembered as the year of the historic record-breaking drought in Alabama. Below normal rainfall over much of the state during the preceding two to three years set the stage for what was to happen in 2007, an epic drought that impacted everyone. Yearly rainfall was less than 50 percent of normal at most locations. Even areas that normally experience the greatest rainfall received only 65 to 75 percent of normal. This led to an exceptional drought, the most severe level of drought, developing across much of North and Central Alabama by late May and early June, with these conditions persisting throughout the remainder of the year.



(Map was valid Decemeber 25, 2007)

Major reservoirs in the state fell to well below normal winter pool levels by fall, with many docks and boats sitting on dry ground. In many instances, these were levels never seen before. Needless to say, recreational businesses on area reservoirs sustained severe business losses with many marinas forced to close. Navigation on the state's major rivers was also severely impacted by low river levels.


Lay Lake in Chilton County


Photo courtesy of Alabama Forestry Commission

Photo courtesy of Stephen Wolfe


Madison County Lake. Photo courtesy of Berns Miller of Ryland, AL

Agricultural interests suffered greatly, with everything from row crops to cattle and livestock severely affected. There were 3,368 wildfires that burned 70,000 acres across the state. Rainfall totals for the year ranged from 11 inches below normal in southern portions of the state up to 31 inches below normal in the north. Many wells across the state ran dry, and over 50 percent of the state's population was put under water conservation or restrictions. This ongoing drought will not be forgotten by anyone experiencing it.

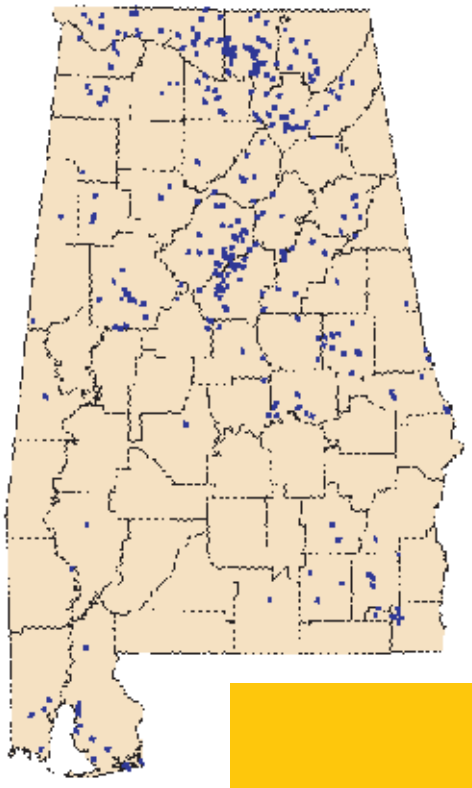
CoCoRaHS
Community Collaborative Rain, Hail & Snow Network

CoCoRaHS is a unique, non-profit, community-based network of volunteers of all ages and backgrounds working together to measure and map precipitation (rain, hail, and snow). By using low-cost measurement tools, stressing training and education, and utilizing an interactive website, this project's aim is to provide the highest quality data for natural resource, education and research applications. We currently operate in many states across the country, including Alabama.

This is a community project. Everyone can help, from the young to the old. This web-based program requires an enthusiasm for watching and reporting weather conditions, and a desire to learn more about how weather can affect and impact everyone's lives.

What will Volunteers be Doing?

Each time a rain, hail or snow storm crosses your area, volunteers take measurements of precipitation from their locations. These precipitation reports are then recorded on the Web at www.cocorahs.org . The data is then displayed and organized for many of our customers to analyze and apply to daily situations, ranging from water resource analysis and severe storm warnings to neighbors comparing how much rain fell in their backyards.

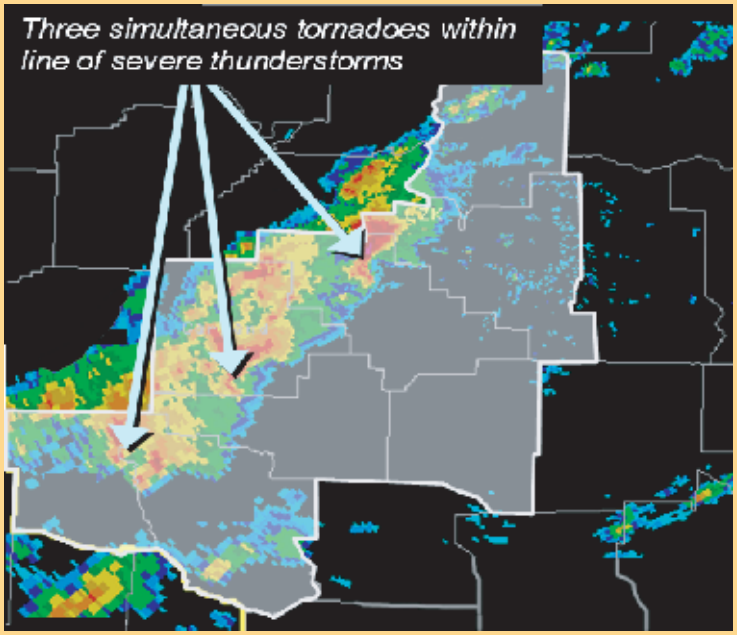


What are the Benefits of Volunteering?

One of the neat things about participating in this network is coming away with the feeling that you have made an important contribution that helps others. By providing your daily observation, you help to fill in a piece of the weather puzzle that affects many across your area in one way or another. You will also have the chance to make new friends as you make a significant contribution and learn some new things along the way. In some areas, activities are organized for network participants including training sessions, field trips, special speakers, picnics, potluck dinners, and photography contests, just to name a few.

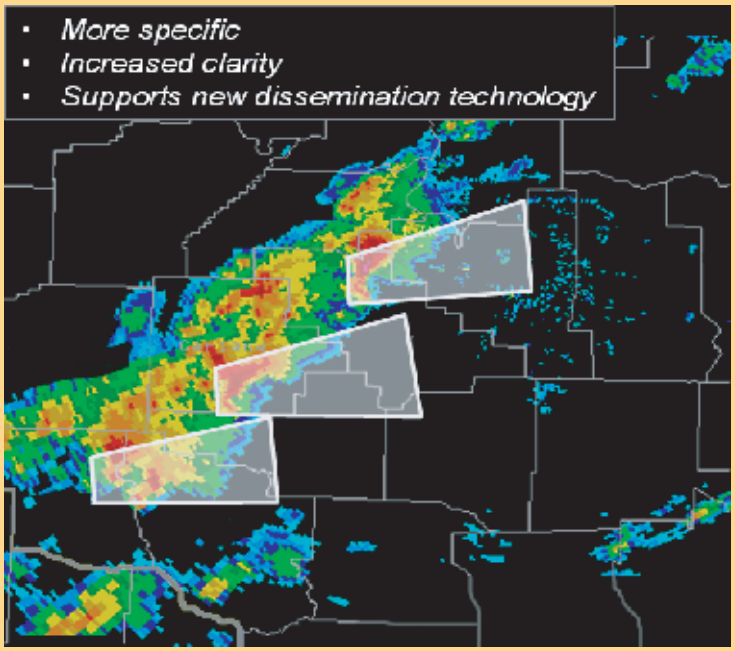
We need you! To sign up, just visit our website
www.cocorahs.org
and click on Alabama. From the Alabama page, click on the Join CoCoRaHS link.

Storm-Based Warnings



In this example, using the former county-based warning system, eight seperate counties, including nearly 1 million people, would be under the tornado warning.

Using the new storm-based warning system, now the warning area is reduced by 70%, removing 600,000 people from the tornado warning.



The National Weather Service (NWS) mission provides weather and hydrologic forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life and property and the enhancement of the national economy. NWS data and products form a national information database and infrastructure which can be used by other governmental agencies, the private sector, the public, and the global community.

The NWS previously issued and disseminated warnings for tornadoes, severe thunderstorms, floods and marine hazards using geopolitical boundaries. However, weather does not adhere to such geopolitical boundaries. Realizing the continuing need to improve the specificity and accuracy of these warnings, the NWS implemented Storm-Based Warnings on October 1, 2007.

Storm-Based Warnings, or threat-based polygon warnings, are essential to effectively warn for severe weather. Storm-Based Warnings highlight the specific meteorological or hydrological threat area and provide more specific information about the location and movement of the severe threat. These new warning polygons are not restricted to geopolitical boundaries. By focusing on the true threat area, warning polygons will improve NWS warning accuracy and quality. Storm-Based Warnings will promote improved graphical warning displays, and in partnership with the private sector, support a wider warning distribution through cell phone alerts, pagers, web-enabled Personal Data Assistants (PDA), etc. NOAA Weather Radio All Hazards will work the same as before and continue to alert entire counties because the county codes will still be used to alarm these radios. The Emergency Alert System (EAS) will also operate utilizing these county codes.

www.weather.gov/sbwarnings

Enhanced Fujita Scale

On February 1, 2007, the National Weather Service began using the new Enhanced Fujita Scale to rate the intensity of tornadoes, and to estimate wind speeds associated with tornadoes and straight-line wind events. The new scale increases the estimated wind speeds for weak tornadoes and lowers the estimated wind speeds for strong to violent tornadoes. These adjustments were based on engineering studies. The Enhanced Fujita Scale is more than just a new scale for rating tornadoes. It also provides a very structured, comprehensive method for conducting storm surveys.

Fujita Scale (mph)	
F0	40-72
F1	73-112
F2	113-157
F3	158-207
F4	208-260
F5	261-318

Enhanced Fujita Scale (mph)	
EF0	65-85
EF1	86-110
EF2	111-135
EF3	136-165
EF4	166-200
EF5	>200

Storm Surveys

When NWS employees conduct storm surveys after severe weather events, the goals are to determine the maximum wind speeds that may have caused the damage, and whether the damage was caused by a tornado or not. The wind speed estimates are based on the evaluation of the degree of damage to structures. These structures are called damage indicators. The Enhanced Fujita Scale uses 28 different damage indicators, which include residences, commercial and retail structures, schools, professional buildings, metal buildings and canopies, towers and poles, and vegetation.

Here is an example (right) of different degrees of damage to a one-family residence and how the Enhanced Fujita Scale helps the storm surveyors determine the wind speeds that likely caused the damage.

NWS staff will typically use the expected wind speed estimates when the damaged structure, or damage indicator, appears to have been built to traditional construction quality or code. If it is determined the building was built to higher or lower standards, adjustments can be made within a given range of wind speeds.

When rating a tornado event, an estimate of the highest wind speed associated with the damage is determined by a survey. However, the rating is rarely based on just one damage indicator. There needs to be supporting evidence from similar damage in the immediate area.

Degree of Damage: Loss of roof covering (<20%).

Expected wind speed: 79 mph.

Rating: EF0

Degree of Damage: Uplift of roof deck and loss of significant roof covering (>20%).

Expected wind speed: 97 mph.

Rating: EF1

Degree of Damage: Exterior walls collapsed.

Expected wind speed: 132 mph.

Rating: EF2

Degree of Damage: Destruction of well constructed residence.

Expected wind speed: 200 mph.

Rating: EF4

The Enhanced Fujita Scale represents a significant improvement over the old Fujita Scale. It provides a comprehensive way of estimating the necessary wind speeds to produce a given degree of damage. See the following web address for more information on the Enhanced Fujita Scale. www.spc.noaa.gov/efscale/

Awareness Starts With You

Basic severe weather preparedness plans must include:

1) A thorough knowledge of safety rules

2) Designation of the best available protective area

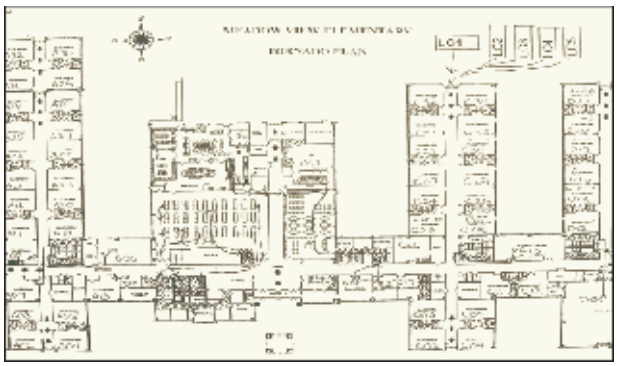
3) A reliable method of communication to receive and exchange information

4) An emergency supply kit

5) Drills to test and practice the plan

6) Contact your local emergency management agency, National Weather Service office, or American Red Cross chapter for additional weather safety information.

Preparing for severe weather is the theme of Severe Weather Awareness Week, so how do we go about it? Preparedness plans come in all sizes as dictated by individual and collective needs. Do you know the basic safety rules? Would your children know what to do if home alone? Are plans ready to move elderly or disabled people to shelter quickly?



An example of a school tornado safety plan, to the right, is provided by Assistant Principal Simms at Meadow View Elementary School in Shelby County. Please be aware of where the tornado safety plan is located at your school, place of employment, local shopping center, recreational facilities, etc.

Preparedness is the key in dealing with any weather hazard!

In 2008, Prepare for the Emergency Before It Happens – Jefferson County Citizen Corps Council, along with other Citizen Corps Councils throughout the state, urges Alabama citizens to make emergency preparedness a top priority.

The Department of Homeland Security's Ready Campaign suggests that everyone have an emergency supply kit, make a family emergency plan, and be informed of the different types of emergencies that can occur and their appropriate responses.

The Emergency Management Agencies and County Citizen Corps Councils across the state encourage you to visit www.ready.gov or call your local Emergency Management Office to learn how to prepare your families, homes, and businesses for all types of emergencies.

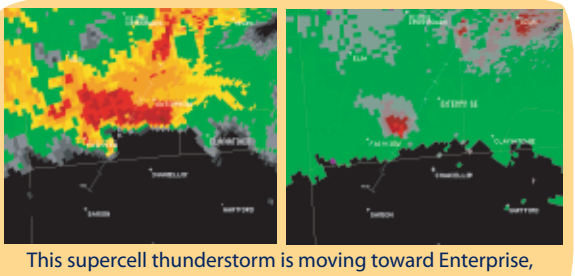
JEFFERSON COUNTY citizen corps COUNCIL

Watch vs. Warning

Although radar, satellite, and computer systems continue to improve, if you do not know what to do or where to go, warnings are not effective! Remember, severe weather can develop rapidly and advance warning time may only be a few minutes. Everyone needs the knowledge to react quickly and execute a plan of action when severe weather materializes.

A **Watch** means that ***conditions are favorable*** for severe thunderstorm, tornado, or flash flood development. **This is the time to be weather-aware.** You should keep alert by listening to a radio, television, or weather radio for the latest weather information. Know where your children are. Be aware of where you will go and what you will do if a severe thunderstorm, tornado, or flash flood threatens.

A **Warning** means a severe thunderstorm, tornado, or flash flood ***has been sighted or indicated by radar.*** **People in the path of the storm should take immediate life-saving actions.**



This supercell thunderstorm is moving toward Enterprise, AL, where it produced an EF4 tornado on March 1, 2007

Weather information direct from the National Weather Service

NOAA Weather Radio All Hazards

A feature available in new weather radio receivers called SAME, Specific Area Message Encoding, allows weather radios to be programmed for the reception of critical information for select counties in your area. Here are the SAME codes for each county in Alabama.

County	SAME #	County	SAME #
Autauga	001001	Houston	001069
Baldwin	001003	Jackson	001071
Barbour	001005	Jefferson	001073
Bibb	001007	Lamar	001075
Blount	001009	Lauderdale	001077
Bullock	001011	Lawrence	001079
Butler	001013	Lee	001081
Calhoun	001015	Limestone	001083
Chambers	001017	Lowndes	001085
Cherokee	001019	Macon	001087
Chilton	001021	Madison	001089
Choctaw	001023	Marengo	001091
Clarke	001025	Marion	001093
Clay	001027	Marshall	001095
Cleburne	001029	Mobile	001097
Coffee	001031	Monroe	001099
Colbert	001033	Montgomery	001101
Conecuh	001035	Morgan	001103
Coosa	001037	Perry	001105
Covington	001039	Pickens	001107
Crenshaw	001041	Pike	001109
Cullman	001043	Randolph	001111
Dale	001045	Russell	001113
Dallas	001047	St. Clair	001115
DeKalb	001049	Shelby	001117
Elmore	001051	Sumter	001119
Escambia	001053	Talladega	001121
Etowah	001055	Tallapoosa	001123
Fayette	001057	Tuscaloosa	001125
Franklin	001059	Walker	001127
Geneva	001061	Washington	001129
Greene	001063	Wilcox	001131
Hale	001065	Winston	001133
Henry	001067		

For SAME codes for the rest of the United States and marine areas visit:
www.nws.noaa.gov/nwr/indexnw.htm

The Voice of the National Weather Service

NOAA Weather Radio All Hazards (NWR), the voice of the National Weather Service (NWS), provides updated weather information continuously, 24 hours a day, 365 days a year. Watches, warnings, advisories, forecasts, current weather conditions, and climate data are broadcast in three to five minute cycles on NWR stations across the nation.

To listen to NWR broadcasts, a special radio capable of receiving signals in the Very High Frequency (VHF) public service radio band is required. Seven frequencies from 162.400 to 162.550 megahertz (MHz) are used. Weather radios can be purchased at most electronics stores and online. Prices of these radios vary from location to location and depend on the type of radio purchased.

NOAA Weather Radio All Hazards is useful anytime, but it becomes more important during severe weather. During threatening weather, normal broadcasts are interrupted, and the focus is shifted to the local severe weather threat. Watches and warnings are given the highest priority and are frequently updated.

NWR is a major part of the Emergency Alert System (EAS) that disseminates critical warning information rapidly through commercial broadcast outlets. In an emergency, each NWR station will transmit a warning alarm tone signal followed by information on the emergency situation. This signal is capable of activating specially designed receivers by increasing the volume or producing a visual and/or audible alarm. Though not all weather band receivers have this capability, all weather radios can receive the emergency broadcasts.

The warning alarm device is normally tested each Wednesday between 11 am and noon, weather permitting.

Thunderstorms

Thunderstorms are a common occurrence in Alabama. Although they can strike at anytime, thunderstorms are most frequent in the spring and summer months, between March and August. Lightning, damaging wind, large hail, tornadoes, and floods are the hazards from thunderstorms.

The best defense against thunderstorms is to stay inside a substantial building. Shelters can protect you from deadly lightning, wind, hail, tornadoes, and heavy rain. Fortunately, thunderstorms usually do not last very long and will generally pass by in less than an hour. When thunderstorms are expected, be sure to pick up loose objects around your home or business before the storms arrive as they can become dangerous projectiles in strong winds.

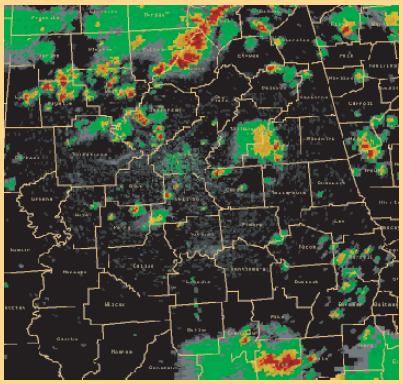
What makes a Thunderstorm Severe?

Any one of these:

- ☒ Tornadoes
- ☒ Wind at or above 58 mph
- ☒ Penny size hail (3/4 of an inch in diameter) or larger.

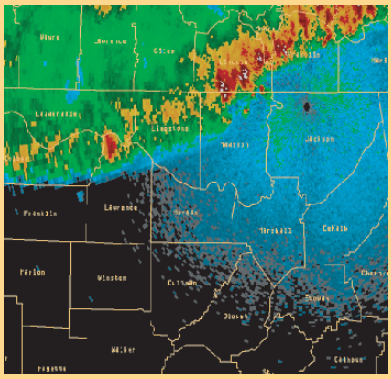
Thunderstorms are Categorized into Three Main Types:

Single-cell Thunderstorms



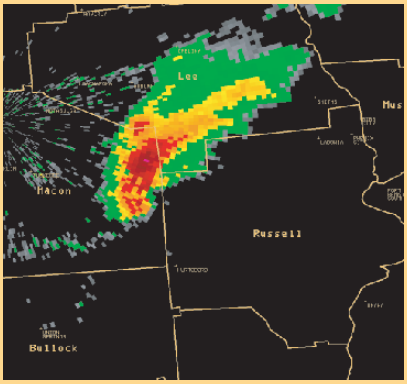
Single-cell thunderstorms, also known as pulse, airmass, or summertime thunderstorms, are individual cells or unorganized clusters of thunderstorms that are not usually severe. Frequent lightning strikes and locally heavy rainfall capable of producing floods are the main hazards from these storms. These slow-moving storms typically occur in the summer when the air is warm, moist, and unstable, and winds are weak.

Multicell (Squall Line) Thunderstorms



Multicell thunderstorms and squall lines are organized complexes of thunderstorms that cover large areas and great distances. These storms are often severe. Damaging wind is the main hazard since they move rapidly. Tornadoes, hail, and heavy rainfall capable of producing flash floods are possible with these storms, as well. Squall lines are most common during the active spring and fall severe weather months of March, April, May, November, and early December.

Supercell Thunderstorms



Supercell thunderstorms are the most dangerous category of thunderstorms. They can produce long-lived tornadoes, winds in excess of 100 mph, and very large hail. Fortunately, they are not common and usually cover small areas. At times, they can be embedded in clusters of thunderstorms or squall lines. Just like squall lines, supercells are most frequent during the active spring and fall severe weather months of March, April, May, November, and early December.

Downtown Huntsville, AL. Photo courtesy of Wes Thomas

Lightning

EVERY THUNDERSTORM contains lightning. The electrical charge of a lightning strike, which may reach 300 million volts, searches for the path of least resistance to complete the circuit from the cloud. It might strike you, an isolated tree, or an object in the open. Keep in mind that you do not have to be standing directly beneath a cloud to be struck. Lightning can strike under clear skies as long as the parent thunderstorm cloud is nearby.

Lightning has been called "the underrated killer" since it usually does not get as much headline attention compared to other dangerous weather phenomena. In a typical year, lightning will strike over 20 million times and will claim more victims than tornadoes or hurricanes. On average, about 100 deaths and 500 injuries occur nationally each year as a result of lightning strikes. Between 1995 and 2007 in Alabama, 121 injuries and 22 deaths have been attributed to lightning.

Dixons Mills, AL
Photo courtesy of Johnny Autery

Anyone outdoors is particularly vulnerable to lightning. To keep people safe when lightning is in the area, every person, group, or school involved in outdoor activities should have a plan that can be activated. Take time to learn lightning safety rules. A quick dash out in the open with a nearby thunderstorm may unnecessarily expose you to the possibility of being struck. Is it worth the risk?

Lightning Safety - Rules to Live By

GET INDOORS IN A STRONG STURDY BUILDING IF AT ALL POSSIBLE!!!

If Indoors:

- **stay away from windows and exterior doors.**
- **avoid using the phone except for emergencies.**
- **turn off, unplug, and stay away from appliances, computers, power tools, and TV sets.**
- **do not shower or bathe.**

If Outdoors:

- **if a motor vehicle (not a convertible) is available, get in it.**
- **stay away from metallic objects such as fences, clotheslines, pipes, poles, and power lines.**
- **stay away from gazebos and dugouts.**
- **get away from bodies of water.**
- **avoid open spaces and high ground.**

For more lightning safety information visit www.lightningsafety.noaa.gov .

Myth: "Lightning never strikes the same place twice."

Damaging Wind & Hail

Overturned bleachers at Cherokee High School (Colbert Co.), July 19, 2006

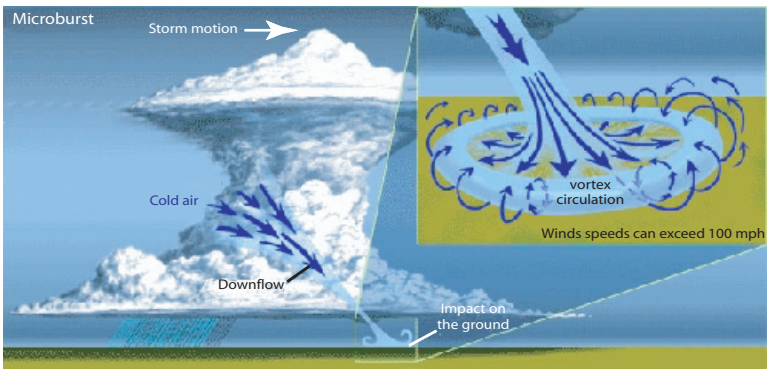
Straight-Line Wind

In Alabama, damaging straight-line winds occur within some thunderstorms each year. They may down trees and power lines, overturn mobile homes, and cause damage to well-built structures.

Storm reports immediately after a severe weather event may attribute significant damage to a tornado when actually strong, straight-line winds are responsible. In fact, straight-line wind events are more common than tornadoes in Alabama. During a typical year, the state experiences straight-line wind events 10 to 20 times more than tornado events.

Downburst/Microburst

A downburst, sometimes known as a microburst, is a type of damaging, straight-line wind that can occur from thunderstorms. A downburst is a very small area of rapidly descending air beneath a thunderstorm that strikes the ground, producing isolated areas of significant damage. Wind speeds associated with downbursts usually exceed 60 mph. On rare occasions, wind speeds can exceed 100 mph. Like a tornado, they may be accompanied by a loud roar. As a result, downbursts are often mistaken as tornadoes.



Downbursts mainly occur during the summer months in single-cell afternoon thunderstorms. The combination of warm, moist, unstable air near the surface and cold, dry air at the mid-levels of the atmosphere provides favorable conditions for downbursts to develop within thunderstorms.

Since downbursts develop quickly in only a few select thunderstorms, they are very difficult to detect and usually occur with little or no advance notice.

Vrendenburgh (Monroe Co.), April 14, 2007

Fort Mitchell (Russell Co.), April 11, 2007
Photo courtesy of Matt Grantham

Hail

Although hail forms in every thunderstorm, it only reaches the ground if the atmospheric conditions are favorable. Hail typically has the best chance of falling to the ground in springtime thunderstorms, when the atmosphere is colder, especially at mid and high levels. Hail may take on many different sizes and shapes, such as a thin flat penny or a baseball.

Large hail can be very dangerous. It can cause damage to objects, such as motor vehicles, structures, and trees. Bodily injuries, or even deaths, can result if people are caught outdoors when large hail occurs.

TORNADOES

Robbins Crossroads area (Jefferson Co.) April 11, 2007

Tornadoes are violently rotating columns of air that descend from thunderstorm clouds and come in contact with the ground. They typically develop when the following atmospheric ingredients come together:

- warm, moist, unstable air near the surface
- strong, atmospheric winds
- a nearby low pressure system to lift the air

In Alabama, most tornadoes occur during two peak severe weather seasons. The spring severe weather season spans March, April, and May. The fall severe weather season includes November and early December. Tornadoes typically occur during the warmest part of the day, between noon and 8 pm. However, they can occur at any hour of the day and night (see graphs on page 19). Therefore, Alabamians are encouraged to be prepared at all times when there is any potential for tornadoes.

Tornadoes have wind speeds that vary from as little as 65 mph to speeds over 200 mph. They move with the thunderstorms that produce them, with forward speeds ranging from nearly stationary to 70 mph. Most tornadoes travel from the southwest toward the northeast.

Remember, tornadoes form quickly! You may have only a few seconds to react and find shelter. When a tornado threatens, your immediate actions can save your life! Know what to do and where to go!

Safety Rules

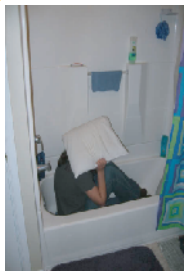
BE Calm Smart Safe

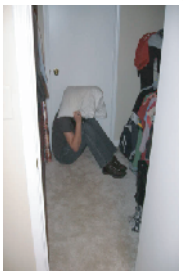
In Homes or Small Buildings:

Go to the basement or a small interior room, such as a closet, bathroom, or interior hallway, on the lowest level. Get under something sturdy like a heavy table, if available. Protect yourself from flying debris with pillows, heavy coats, blankets, or quilts. Use bicycle or motorcycle helmets to protect your head.

Stay away from windows, doors, and outside walls!

Do not bother opening or closing windows and doors, as this will not protect the structure. This will waste valuable time which may put yourself and possibly others at greater risk. Use those valuable seconds to find a place of safety. Remember to protect your head!





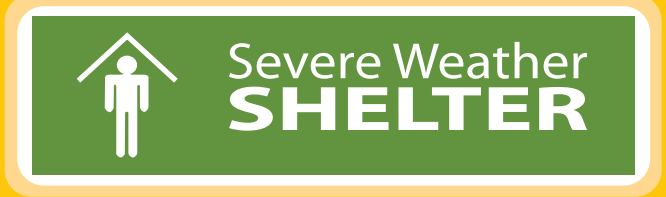
Community Storm Shelter in Vincent (Shelby Co.)
Photo courtesy of Shelby Co. EMA

In Mobile Homes or Vehicles:

Leave them and go to a strong building. If there is no shelter nearby, get into the nearest ditch, depression, or underground culvert and lie flat with your hands shielding your head.

In Schools, Nursing Homes, Hospitals, Factories, and Shopping Centers:

Go to the best available, pre-designated, protective area. Basements are best, but interior locations on the lowest level also offer protection. Stay away from windows and other hazards inherent to the building.



Floods

Believe it or not, floods are the most damaging, costly, and deadly severe weather-related phenomena. Each year, they cost the U.S. over $2 billion in property damage and are responsible for roughly 150 deaths.

All of Alabama is vulnerable to floods, anytime of the year. Due to Alabama's close proximity to the Gulf of Mexico, the state has an almost unlimited supply of moisture available. When low pressure systems move into the area and combine with this moisture, the resulting rains can be heavy and produce floods. Also, slow-moving, summertime thunderstorms can produce flooding rains in a very short period of time.

Paint Rock (Jackson Co.), December 2004

Flash Flood

Flash floods can occur within a few minutes or hours of heavy rainfall or from a dam or levee failure. These floods can destroy structures, down trees, roll boulders, and create new waterways. Rapidly rising water can reach heights of 30 feet or more! Furthermore, flash flood producing rains can also trigger catastrophic mudslides. You may not always have a warning of these sudden and deadly floods.

Whitesburg (Madison Co.), May 2003

Urban Flood

Floods can be magnified in urban areas. As land is converted from fields and woodlands to roads and parking lots, it loses its ability to absorb rainfall. Urbanization increases runoff two to six times over what would occur on natural terrain. During periods of urban flooding, streets can become swift moving rivers, while basements can become death traps as they fill with water.

Brownsboro (Madison Co.), February 2004

River Flood

River floods are a natural and inevitable part of life in Alabama. Low lying areas near rivers, streams, lakes, and reservoirs are susceptible to river floods. Some river floods occur seasonally when winter or spring rains fill river basins with too much water too quickly. Others can occur from slow-moving low pressure systems. Torrential rains from decaying hurricanes or tropical systems can also produce river floods.

Shoal Creek (Lauderdale Co.), February 2003

Area Flood

These nuisance long-duration floods are usually not life-threatening. Standing water in a low-lying area such as an open field is an example of an area flood. Significant agricultural losses and displaced livestock can occur with these floods. In addition, stagnant water from this type of flooding can serve as a breeding ground for insects and diseases.

Flood Safety

Types of Flood Watches and Warnings Issued by the National Weather Service

The driver of this vehicle is putting himself in incredible danger.

NEVER drive your vehicle across flooded roadways!

Shoal Creek (Lauderdale Co.), February 2003

FLASH FLOOD WATCH

Issued when conditions are favorable for flash floods (sudden short-term floods that last 6 hours or less). This includes floods from dam or levee failures.

FLOOD WATCH

Issued when conditions are favorable for long-duraton floods (longer than 6 hours). This includes river floods.

FLASH FLOOD WARNING

Issued when floods occur or are imminent within 6 hours of the event.

FLOOD WARNING

Issued when floods occur or are imminent and are expected to persist for more than 6 hours.

RIVER FLOOD WARNING

Issued when a flood is occurring or expected to occur near streams, rivers, lakes, or reservoirs.

Flood Safety Rules

**** Move to higher ground and stay away from low-lying areas such as streambeds, drainage ditches, and culverts.***

Heavy rainfall or dam/levee failure may cause excessive water to run off rapidly, overflowing natural and man-made drainage systems with rushing flood waters. These flood waters may carry debris that can cause serious injury or even death.

**** Stay out of flooded areas.***

In flooded areas, water may still be rising and is usually swift. Children are especially vulnerable and should not be allowed to play or walk in flowing water. Only 6 inches of fast-moving water is necessary to sweep you off your feet.

**** Never drive your vehicle into water of unknown depths or around barricades.***

Many flood deaths occur when people drive their vehicles into flood waters. Flood waters may rise very quickly and could cover the vehicle or sweep it away. Just 2 feet of water can move most vehicles, including buses and trucks. If your vehicle stalls, abandon it and immediately seek higher ground.

Water is a very powerful force that should never be underestimated!

Safety After the Storm

Safety does not stop after the storm has passed. Everyone should be aware of the many dangers that might exist after bad weather has moved out of the area.

Macedonia (Jackson Co.), June 19, 2007

Trinity (Morgan Co.), June 19, 2007

1) Remain calm.

2) Deal with immediate problems such as protecting yourself and others first, then attend to those who are injured until professional help arrives.

3) Locate your emergency supply kit containing essential documents and materials for taking care of yourself and others.

4) Do not light matches, burn candles, or turn on electrical switches if you suspect damage to your home or business, as any of these actions can ignite fires.

5) Carefully check for damage around your home or business.

   Trees and tree limbs may be weakened and could fall unexpectedly, so use caution when walking through areas where high wind or tornadoes have passed through.

   STAY AWAY FROM DOWNED POWER LINES! Do not attempt to touch or move them. Keep children and pets away. Report downed wires to your local power company.

   If you smell gas or suspect a leak, turn off the main gas valve, open windows, and get everyone out of the structure quickly.

6) Clean up or rope off dangerous areas.

7) Remember to care for pets after a disaster has occurred.

Miller's Ferry (Wilcox Co.), March 1, 2007

Enterprise (Coffee Co.), March 1, 2007

Newbern (Hale Co.), October 23, 2007

Storm Spotters

Storm spotters play a vital role in the warning system. They come from all walks of life, joined by their interests in weather and community service. Spotters are associated with SKYWARN, a volunteer program developed by the National Weather Service (NWS), to train and organize spotters. Spotters are organized around local emergency management agencies, amateur radio clubs, personnel from fire departments, rescue squads, law enforcement agencies, and public participants.

Spotters are critical because they provide timely information on the actual weather that is occurring at or near the ground. This information is known as ground truth. Satellite imagery and Doppler radar provide NWS meteorologists with large amounts of information about storm structure, but not on the actual weather occurring at or near the ground. This is where spotters become the eyes and ears for their communities. This ground truth combined with radar and satellite data is used during the warning decision process. With early warning, lives can be saved.

Storm spotters go through training provided by the NWS to gain an understanding of thunderstorm structure, exposure to visual clues, tornado safety, and procedures for reporting information.

Warning Coordination Meteorologist Jason Wright presenting a Storm Spotter Class.

Amateur radio area inside the National Weather Service

The Alabama Emergency Response Team, ALERT, comprises one of the largest groups of amateur radio operators in Alabama. Communication of critical storm spotter reports often falls to this group because of their willingness and commitment to use their radios when conventional power and communication methods are knocked out by severe weather. NWS offices across the state have established working relationships with the amateur radio community by including radio equipment in the offices, for ALERT members to communicate with spotters during rapidly changing and dangerous weather situations.

More information on storm spotter activities can be found on the NWS internet web sites (see page 17). For information on amateur radio, visit www.alert-alabama.org .

Working to assist in the educational effort to prepare Alabamians for severe weather, the Alabama SKYWARN Foundation is a non-profit organization established to provide local assistance to the NWS in promoting statewide weather education. Education is an important key to keeping the toll in deaths and injuries to a minimum. Through an understanding of the dangers we face in Alabama and the safety precautions we need to take when the weather threatens, people in Alabama can respond quickly in the face of danger.

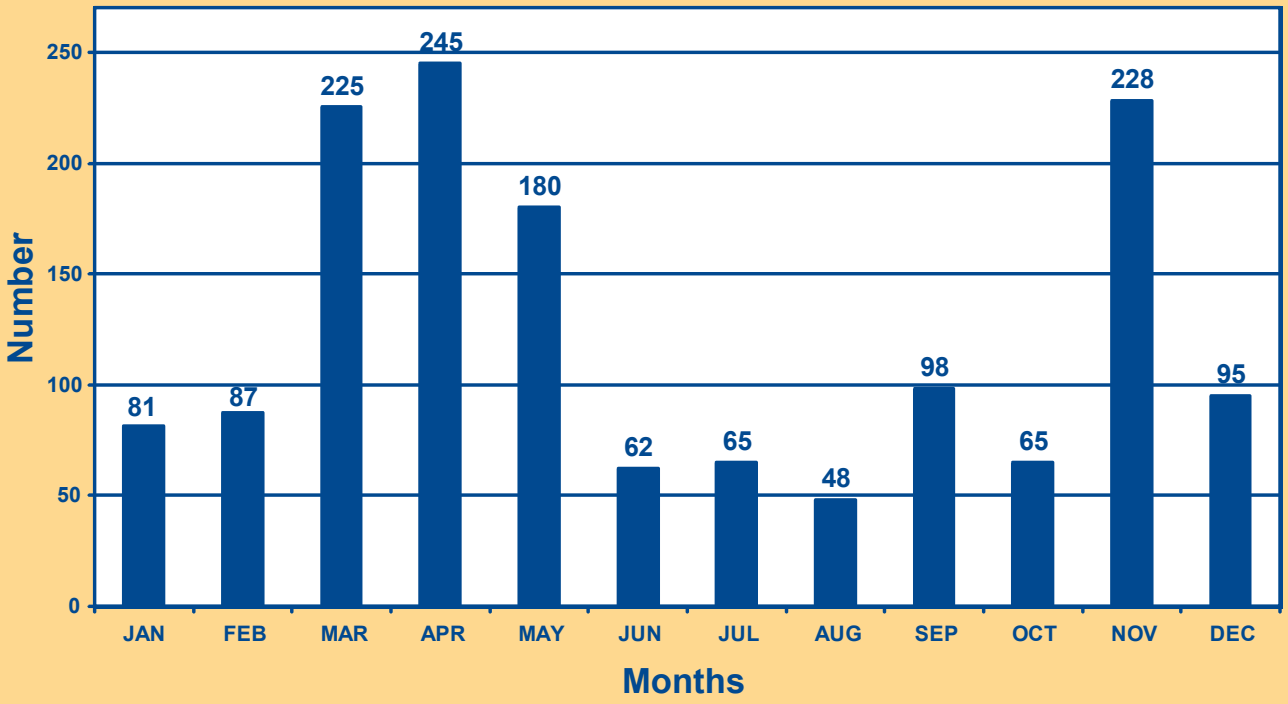
The Alabama SKYWARN Foundation relies on tax deductible donations to underwrite the costs of producing and distributing weather-related educational material. The Foundation is pleased to have the help of such wonderful groups as Mercedes-Benz International, Russell Corporation, Jim Walter Resources, Black Warrior Methane, Jefferson County Citizen Corps Council, Jefferson County Emergency Management Agency, and the American Red Cross Birmingham Chapter for their direct support in making this annual publication possible.

The Foundation hopes that with your support additional efforts can be taken to improve severe weather safety and awareness across our great state. More information about the Foundation can be found at www.alabamaskywarn.org .

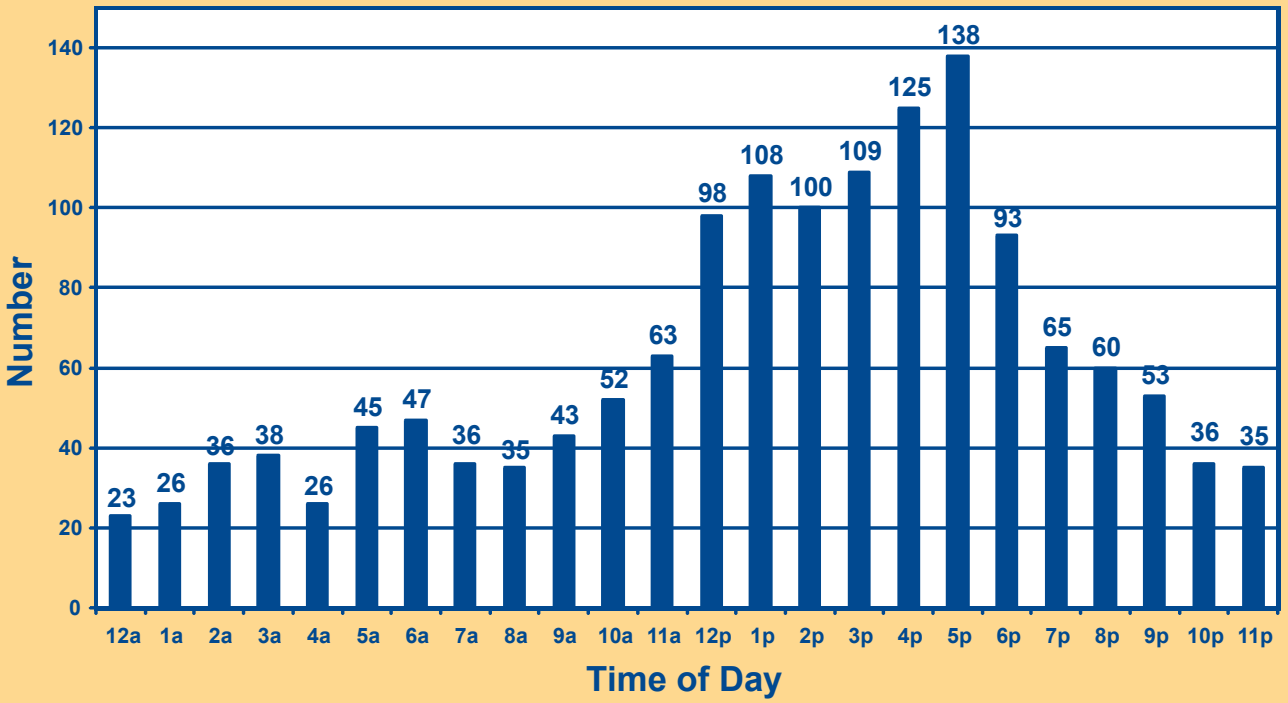
Alabama SKYWARN Foundation, Inc.

Tornadoes by Month and Hour in Alabama

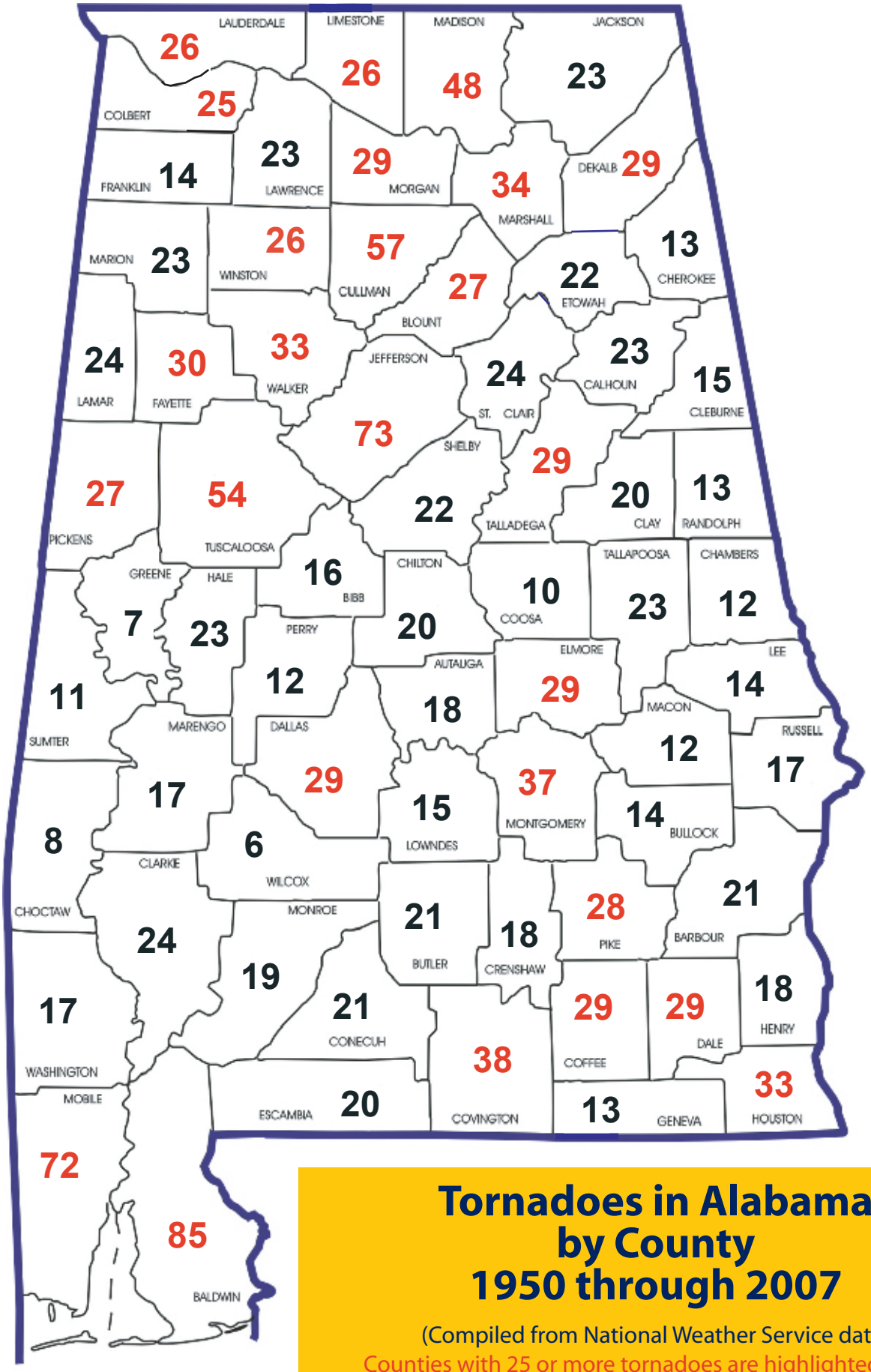
Tornadoes By Month
1950 - 2007



Tornadoes By Hour
1950 - 2007



Tornadoes by County in Alabama



Tornadoes in Alabama by County 1950 through 2007

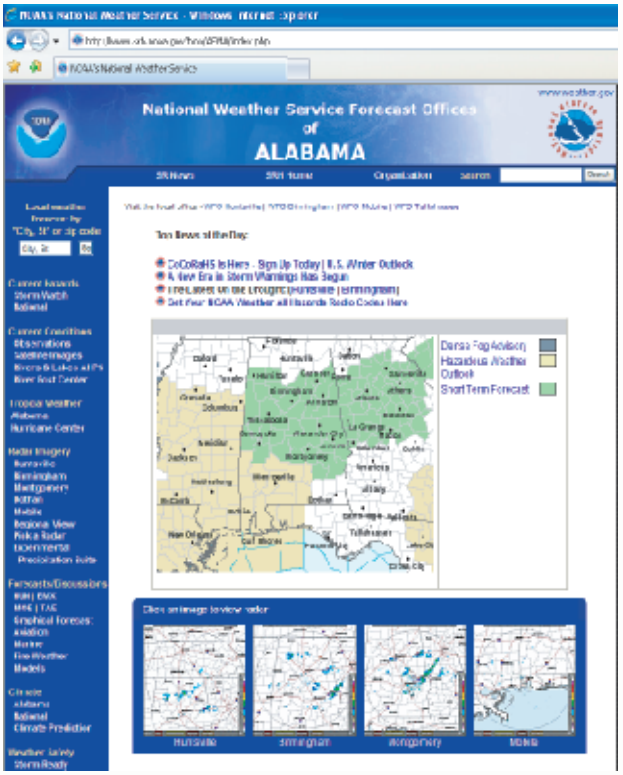
(Compiled from National Weather Service data)

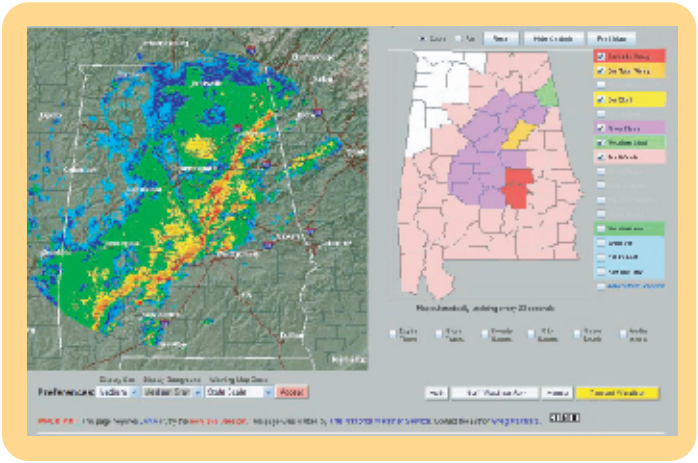
Counties with 25 or more tornadoes are highlighted in red.

NWS on the Web

The National Weather Service (NWS) is dedicated to providing the most up-to-date weather information to each and every community using the latest technology. Forecast offices are staffed around the clock with meteorologists performing a wide range of duties from issuing warnings on the most life threatening storms to the pleasant task of issuing a sunny day forecast. Once a warning or forecast has been issued, it is disseminated through numerous communication networks including weather wires, NWS Weather Radio All Hazards, and the Internet.

One of the areas that is the most accessible for the public is the award winning NWS Internet site. Nowhere else will you find such complete, in-depth coverage of your local weather. For any location in the United States, a network of 122 offices provides all your weather needs in a standardized, easy to navigate website. Whether you are seeking radar, climate, or forecast information, the site provides a one-stop shopping point. In addition to those features, every NWS internet site has a clickable weather status map. This map displays all current watches, warnings, statements, and advisories, quickly alerting you of any weather threats that may be occurring in your area. That's just the front page...





Storm Watch

An enhanced storm watch webpage can be found at http://nsstc.uah.edu/alclimate/weatherwatch/wxwatch.php. This user friendly page allows you to display live radar data next to a color coded map that highlights the latest weather hazards for Alabama and surrounding areas. The radar data and color coded map can be customized to fit your needs. Not to mention, valid NWS products including watches, warnings, and advisories for Alabama can be viewed by clicking on the color coded active product map.

Point-and-Click

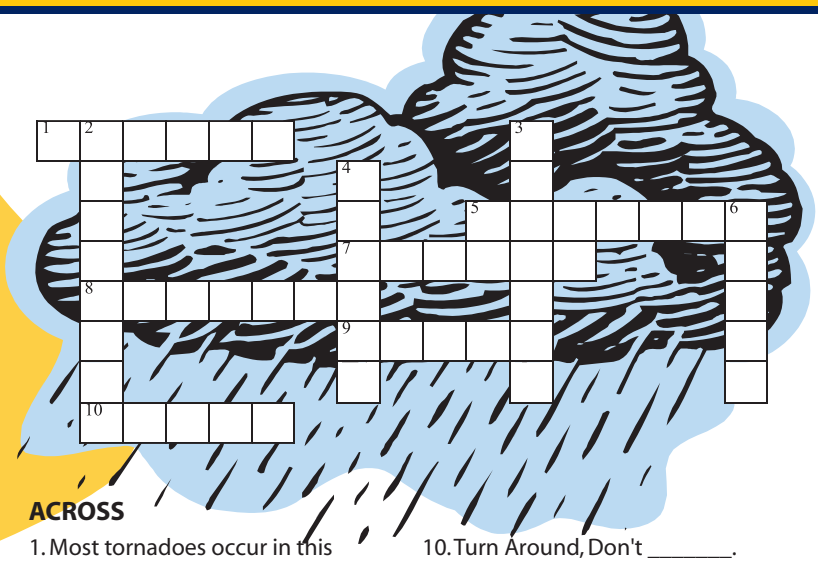
Another web feature is the point-and-click forecast map which allows you to retrieve customized weather forecasts using the NWS National Digital Forecast Database (NDFD). NDFD incorporates high resolution graphical forecasts of precipitation, temperature, wind, and sky cover across the entire nation. From this expansive database, you can get as detailed as one-hour forecasts for your location or regional graphical forecasts for the next seven days.

www.weather.gov

GAMES AND PUZZLES

L	M	R	O	T	S	R	E	D	N	U	H	T
O	I	B	Q	F	H	B	L	W	V	O	U	A
K	P	G	A	D	Z	M	H	J	N	J	R	G
L	I	A	H	P	U	M	Q	B	S	J	R	K
Z	V	E	N	T	L	A	T	C	T	E	I	L
I	Y	S	K	M	N	A	W	T	G	N	C	M
O	C	U	W	R	V	I	I	D	B	I	A	O
O	E	P	H	F	M	T	N	H	F	L	N	T
J	G	E	K	U	L	Y	D	G	P	L	E	Q
T	O	R	N	A	D	O	E	M	U	L	Z	H
Y	W	C	P	S	S	Y	O	N	O	A	N	R
T	Q	E	F	L	I	R	B	D	I	U	C	S
R	I	L	B	I	F	M	P	O	X	Q	F	L
A	O	L	D	O	W	N	B	U	R	S	T	B

DOWNBURST
FLOOD
HAIL
HURRICANE
LIGHTNING
SQUALL LINE
SUPERCELL
THUNDERSTORM
TORNADO
WIND



ACROSS

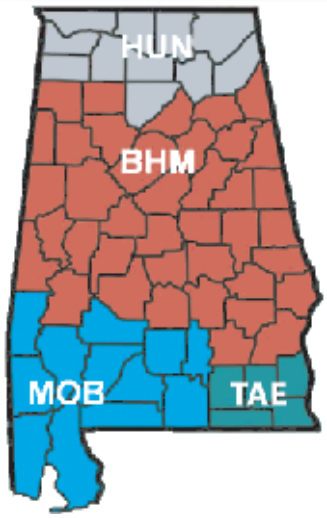
1. Most tornadoes occur in this season.
5. NOAA Weather Radio All _____
7. Enhanced _____ Scale
8. Tornadoes can occur _____ day or night.
9. There are _____ main types of thunderstorms.
10. Turn Around, Don't _____.

DOWN

2. Always be _____ for severe weather.
3. National _____ Service.
4. Know and follow the _____ rules.
6. _____ Spotters.

Contacts for More Information

Alabama National Weather Service Offices



Southwest Alabama
Mobile (MOB)
Gary Beeler or David McShane
251-633-6443
www.srh.noaa.gov/mob

North Alabama
Huntsville (HUN)
Tim Troutman or Mike Coyne
256-890-8503
www.srh.noaa.gov/hun

Southeast Alabama
Tallahassee, FL (TAE)
Bob Goree or Paul Duval
850-942-8833
www.srh.noaa.gov/tae

Central Alabama
Birmingham (BMX)
Jason B. Wright or Jim Stefkovich
205-664-3010
www.srh.noaa.gov/bmx

For the Alabama Emergency Management Agency, contact Yasamie Richardson in Clanton at 205-280-2275.

For the American Red Cross, contact your local chapter or Cindy Bahri in Birmingham at 205-458-8263.

For the Alabama Department of Education, contact the Information & Communication Office in Montgomery at 334-242-9950.

The National Weather Service has issued a Tornado Warning for...

How Many Ways Do You Get National Weather Service Information?

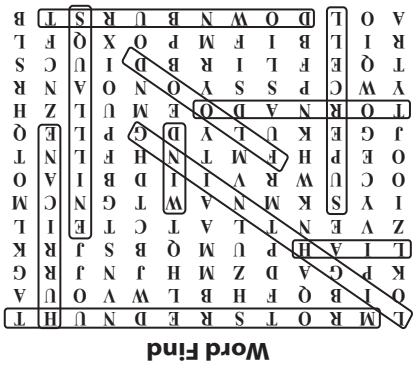
National Weather Service
465 Weathervane Road
Calera, AL 35040-5427

Anywhere/Anytime Weather Forecasts

You can now receive your weather forecast from the National Weather Service anywhere/anytime using your wireless device. All you need is a wireless device that can surf the Internet along with a wireless Internet service provider.

www.srh.noaa.gov/wml

Game and Puzzle Solutions



Word Find

CrossWord

Across
1. spring
5. hazards
7. Fujita
8. anytime
9. three
10. drown

Down
2. prepared
3. weather
4. safety
6. storm