

February 15-19, 2021

Mississippi Severe Weather Preparedness Week

MISSISSIPPI SPRING SEVERE WEATHER PREPAREDNESS WEEK

February 15-19, 2021



Overview

Residents of Mississippi are no strangers to the many different forms of hazardous weather. Tornadoes, damaging winds, large hail, lightning, flooding, and even winter weather are all common weather phenomena that occur in Mississippi. When looking at statistics for the number of tornadoes, and tornado fatalities, Mississippi ranks near or at the top in every category. These statistics show a long history of tornado impacts across the state.

This presents a preparedness challenge to the residents of Mississippi. Unlike the traditional tornado alley of the Great Plains, tornadoes are difficult to spot in Mississippi. Some of the reasons for this are poor visibility in the form of numerous trees in the state, the fact that many tornadoes in Mississippi are rain-wrapped, and that many Mississippi tornadoes occur at night. In addition, many homes and other structures are not built as strong as buildings in other parts of the country.

All of these factors make it very important for residents of the Magnolia State to have multiple ways of receiving weather warnings, have a shelter plan in place ahead of time, and take outlooks, watches and warnings seriously. These actions contribute to reducing injuries and fatalities. Situational awareness and proper planning are essential to safety. In this brochure, there will be safety tips for each type of hazardous weather phenomenon we encounter in Mississippi during the spring months.

Mississippi Severe Weather Preparedness Week Events February 15 - February 19, 2021

Throughout the week, the National Weather Service, MEMA, and local emergency managers will present educational material via each office's webpage and social media outlets. A tornado drill will be conducted to help people prepare and protect themselves from tornadoes, damaging winds, hail, lightning, and flash floods. Each day of the week focuses on a specific type of severe weather, or on the warning and drill system.

- **Monday, February 15th** will discuss severe thunderstorms. Lightning, large hail, and damaging winds from severe thunderstorms are much more frequent than tornadoes in the South.
- **Tuesday, February 16th** will draw attention to hazards of flooding and flash floods. Flooding is the number one cause of weather-related fatalities behind heat. Remember...Turn Around, Don't Drown!.
- **Wednesday, February 17th** will emphasize tornado safety. Repeatedly, people survive tornadoes by knowing weather safety rules and by taking appropriate and timely action. A statewide tornado drill will be conducted at **9:15 AM CST**. Schools, businesses and other agencies are encouraged to participate with the goal of helping everyone learn life saving rules. Thursday will be the alternate drill day if adverse weather is expected on Wednesday.
- **Thursday, February 18th** will focus on lightning, often called the underrated killer. All thunderstorms have lightning and this hazard can be deceptively deadly.
- **Friday, February 19th** will discuss ways to receive hazardous weather advisories, watches, and warnings.

Cover photos courtesy of:

- *Radar image of Easter Sunday's, April 12, 2020, strong and violent tornadoes across Southeast Mississippi.*
- *Lightning at the Marion County Courthouse in Columbia, MS on August 19, 2020: Will Jordan*
- *Flooding in Sebastopol, Scott County, on May 11, 2020: Thomas Howard*

Severe Thunderstorms

Monday, February 15, 2021



A shelf-cloud moving over the Mississippi River toward Vicksburg, Warren Co. - August 13, 2020 - Paul Ingram

What is a Severe Thunderstorm?

A severe thunderstorm is a thunderstorm that produces one or more of the following: hail that has a diameter of one inch (quarter size) or larger, winds greater than or equal to 58 mph, and tornadoes. About 10% of all thunderstorms in the United States meet severe criteria.

Severe thunderstorms can occur at any time of the year, although the most common time of occurrence is during the spring months of March, April, and May. In addition, pulse-type thunderstorms that occur during the summer months can produce high winds, frequent lightning, and torrential downpours.

A secondary season of organized severe weather occurs during the fall in November and early December.

What is the Difference between a Watch and a Warning?

A severe thunderstorm/tornado watch means that **conditions are favorable for severe thunderstorms/tornadoes to develop.** These are issued by the Storm Prediction Center in Norman, OK, typically before severe weather develops. Watches tend to last several hours and cover many counties.

A severe thunderstorm/tornado warning means that a **severe thunderstorm/tornado has either been indicated on radar or witnessed by storm spotters.** Your local NWS Forecast Office issues severe thunderstorm warnings when severe weather is developing or occurring. Warnings tend to be less than an hour and cover a smaller area than a watch (i.e. 1-2 counties or less).



Straight-line winds in excess of 60 mph downed trees along a road near Raymond in Hinds County on June 17, 2019. Photo by Jacob Lanier

Safety Tips

- **Have a plan.** Prepare ahead of time so you and your family know what actions to take when severe weather occurs.
- **Get indoors!** There is no safe place outdoors during a thunderstorm.
- **Stay informed!** When severe weather threatens, stay tuned to NOAA Weather Radio, local television and radio stations, or the NWS homepage online at www.weather.gov for up to date information on the weather situation. Click on the office that serves your area.
- **Know what county you are in.** When a warning is issued, the threatened area will be identified by the counties that contain the warned thunderstorm.
- **Have a NOAA Weather Radio.** This is the best way to receive the latest and most up to date weather information from the National Weather Service.

Damaging Winds: Not All Wind is a Tornado

A common misconception regarding severe weather is that if there was strong wind that did damage, it must have been a tornado. Not all wind damage occurs from tornadoes. In fact, some of the worst damage is not associated with tornadoes at all. There are several types of damaging wind storms that can occur in Mississippi.



Straight-line winds of 70 mph flipped and destroyed this boat near Smithville, MS in Monroe County on May 25, 2015.

Photo by: NWS Memphis, TN

Meteorologists can determine if the cause of the damage was from straight line winds or a tornado simply by looking at the direction the damage is laid out in. Straight line wind damage will push debris in the same direction the wind is blowing (hence the creation of the term straight line). Tornado damage will scatter the debris in a variety of different directions since the winds of a tornado are rotating violently. To reduce the damage from straight line winds, it is important to secure objects that can be blown by the wind and to keep trees well pruned. Tree branches falling on cars or houses produce a significant amount of damage in high wind events. Also make sure you are in a safe place when straight line winds strike such as in the interior of a brick home.

Another type of straight line wind that occurs is called a derecho. Derechos are created by the merging of many thunderstorm cells into a cluster, or solid line, extending for many miles. These tend to be fairly fast moving lines of thunderstorms that may travel 500 to 600 miles. Derechos typically occur in the summer months when complexes of thunderstorms form over the Great Plains. They are particularly dangerous because the damaging winds can last a long time and cover a large area. One such event occurred in June 2012, when a derecho plowed through the Mid-South, bringing 80 mph winds and structural damage to portions of the Mississippi Delta.

A third type of damaging wind that can occur are microbursts. While straight line winds tend to occur in weather systems that are widespread, microbursts are fairly localized. A microburst is a small, concentrated downburst that produces an outward burst of damaging winds at the surface. Microbursts are generally small (less than 4 km across) and short-lived, lasting only 5-10 minutes, with maximum wind speeds up to 100 mph. There are two kinds of microbursts: wet and dry. A wet microburst is accompanied by heavy precipitation at the surface, whereas dry microbursts occur with little or no precipitation reaching the ground. Microbursts tend to be a little more common during the spring and summer months in Mississippi, but can also occur in the fall and winter.

Damaging wind, often also referred to as straight line winds, tends to be more common than tornadoes. Damage from these winds account for half of all severe reports in the continental United States. Wind speeds can reach up to 100 mph and produce a damage path extending for hundreds of miles, in association with both squall lines and supercell thunderstorms. While these winds can occur any time of the year, climatologically the number of damaging wind reports increases during the spring months and peaks during the summer months in Mississippi. One notable significant wind event was January 11, 2020. In this event, a squall line moved through the region, producing wind damage to portions of the Delta. 70-80 mph winds were detected in Greenville, MS.



Shelf cloud observed along I-10 near Hwy 603 in Waveland, MS in Hancock County on May 27, 2015.

Photo by: Christine Cuicchi



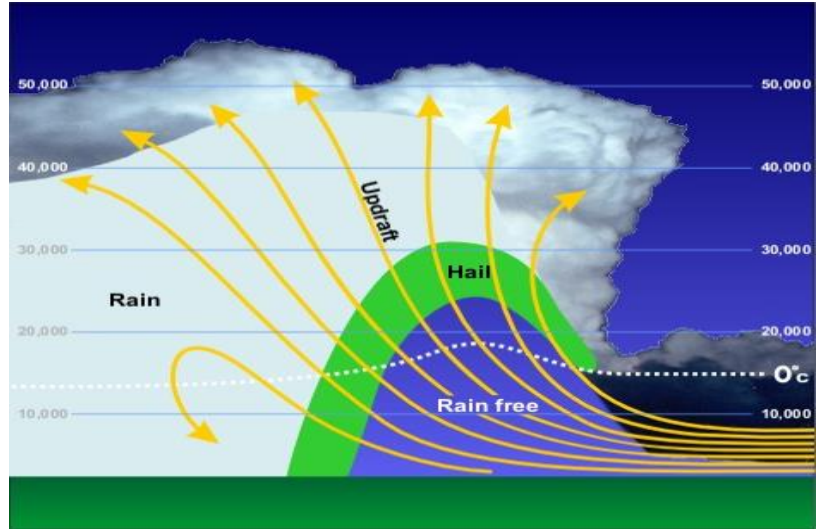
Wet Microburst - 1991 Photo by William Bunting

Severe Thunderstorms—Hail

Monday, February 15, 2021

How Does Hail Form?

Hail forms when water droplets are drawn into an area of strong upward moving air, known as an updraft, of a storm. Once the water droplets are transported above the freezing level, they combine with tiny airborne particles, such as dirt, salt, volcanic ash, etc., and freeze on contact, forming tiny ice particles. These ice particles are light enough that they remain suspended in the cloud, where they undergo processes that allow them to combine with other super-cooled water droplets and grow into hail stones. Once the hail stones are heavy enough to overcome the upward force of the updraft, they fall out of the cloud and can inflict significant damage to automobiles, buildings, crops, and even people.



Measuring Hail

It's often difficult to get an accurate measurement of hail diameter, especially when it's falling. The table below helps observers estimate the size of hail based on the average diameter of common items. When in doubt, play it safe and wait until the thunderstorm has moved away before going outside to measure the hail's size.

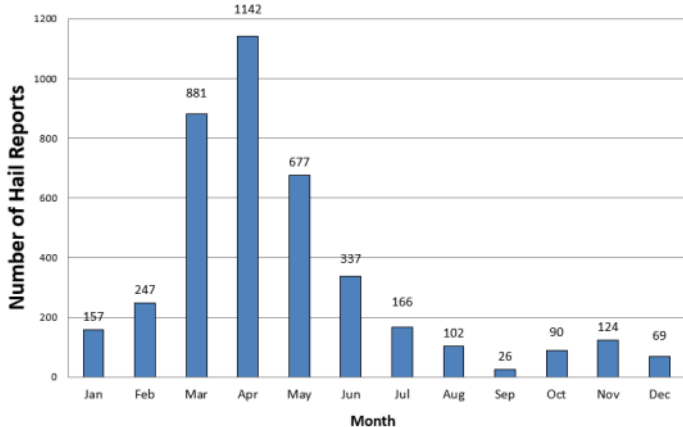


Golf ball sized hail in Lexington, Holmes County, on April 7, 2019
Photo by Logan Ledbetter

Hail Size Estimates

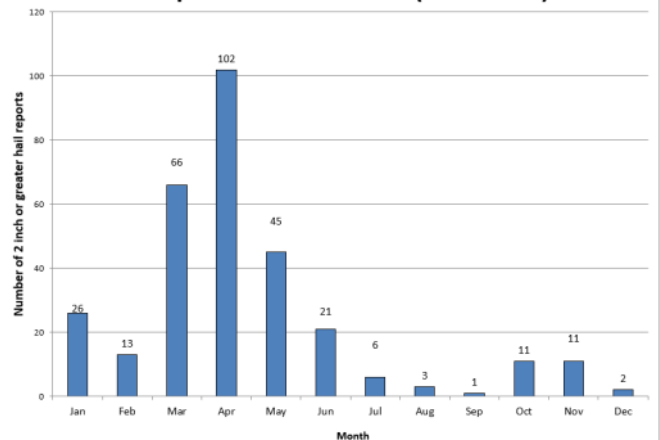
Pea.....	1/4 inch
Penny.....	3/4 inch
Nickle.....	7/8 inch
Quarter.....	1 inch
Half Dollar.....	1 1/4 inches
Ping Pong Ball.....	1 1/2 inches
Golf Ball.....	1 3/4 inches
Tennis Ball.....	2 1/2 inches
Baseball.....	2 3/4 inches
Tea Cup.....	3 inches
Grapefruit.....	4 inches
Softball.....	4 1/2 inches

Reports of ≥ 1 inch Hail (1950-2020)



1 inch or greater hail reports across MS since 1950

Reports of ≥ 2 Inch Hail (1950-2020)



2 inch or greater hail reports in MS since 1950

Flooding and Flash Flooding are the top weather related killers!

Tuesday, February 16, 2021



Flooding at a car dealership in Greenville, Washington Co, on May 9, 2019. Photo by Robert Vest

Did you know that flash flooding is the second leading cause of weather related fatalities, based on a thirty year average? In 2017, flood fatalities accounted for twice as many fatalities as lightning, tornado and hurricanes combined!

FLASH FLOODING: Flash floods can occur within a few minutes or up to six hours after excessive rainfall, with a dam or levee failure, or with a sudden release of water held by an ice jam or mud slide. Flash floods can wash out roads and destroy buildings and bridges. Because flash floods happen in a short period of time (less than six hours after the causative event) they are more life threatening than other types of flooding. Areas most susceptible to flash flooding are mountainous streams and rivers, urban areas, low-lying areas, storm drains, and culverts.

A Flash Flood Warning is issued when flash flooding has been reported or is imminent. It focuses on specific communities, creeks or streams, or other geographic areas where flooding is imminent or occurring.

A **FLASH FLOOD EMERGENCY** is issued when there is confirmation of an immediate threat to life and property, many times in the form of water rescues or evacuations, due to rapidly rising water levels from either extremely heavy rainfall over an area or a dam failure.

RIVER FLOODING: This type of flooding is caused by an increased water level in established watercourses, such as rivers, creeks, or streams. River flooding is slower to develop than flash flooding (more than six hours after the causative event); however, some smaller creeks and streams have a short lag time between the runoff from heavy rain and the onset of flooding. On the other hand, it may take several days for a flood crest to pass downstream to points on major rivers such as the Pearl and Mississippi rivers. The NWS issues river flood warnings when rivers are expected to rise above flood stage. Persons in the warned area are advised to take necessary precautions immediately. River stages and crest forecasts are given for selected forecast points along with known flood stages for each forecast point. While there is usually more advanced warning time with river floods than with flash floods, persons should be familiar with the flood prone areas they live and work in, and must know what action to take and where to go if a flood occurs. Advance planning and preparation is essential.



The aftermath of river flooding along Black Creek at Hwy 589 in Lamar County, from March 8-13, 2016. Photo by Lamar EOC

FLOOD WATCHES: The NWS issues a Flood Watch when conditions are anticipated that could result in either flooding or flash flooding within a designated area. Persons in the watch area are advised to check flood action plans, keep informed, and be ready to take action if a warning is issued or flooding is observed.



FLOOD SAFETY RULES: Follow these tips to stay safe during flood conditions...When a warning is issued get out of areas subject to flooding. These may include dips, low spots, stream beds, drainage ditches and culverts. If caught in low areas during flooding, go to high ground immediately.

Avoid already flooded and high velocity flow areas. A rapidly flowing stream or ditch can sweep you off your feet or even carry your car or truck downstream.

Never drive through a flooded area as the road bed may be washed away. Play it safe! If you encounter a flooded road - **TURN AROUND, DON'T DROWN!**

Be especially cautious at night when it is harder to recognize flood conditions, and never drive around a barricaded road.

Most flood deaths occur at night and when people become trapped in automobiles that stall in areas that are flooded. If your vehicle stalls, abandon it immediately and seek higher ground. The rising water may engulf the vehicle and the occupants inside. Do not camp or park your vehicle along streams or creeks during threatening conditions.

When a FLASH FLOOD WARNING is issued for your area, act quickly to save yourself. You may only have seconds!

Tornadoes

Wednesday, February 17, 2021



EF4 tornado in Enterprise, MS, Clarke County, on April 27, 2011. Photo by Storm Focus

What is a Tornado?

A tornado is a violently rotating column of air that extends from the base of a storm cloud to the ground. Some conditions that are conducive for tornado formation include warm, moist, unstable air, strong atmospheric winds that increase in speed and change direction with height, and a forcing mechanism to lift the air. When a combination of these factors comes together just right, tornadoes form. The most common time of year for tornado formation in Mississippi is during the spring months of March, April, and May, with a secondary tornado season in November. Tornadoes can occur at any time of day and at any point during the year given the right environment. Many tornadoes occur at night in Mississippi, especially during the fall and winter months.

Tornadoes and Car Safety

Being prepared for severe weather and tornadoes is important no matter your location, but this is especially critical if you are in a car when a tornado approaches. The winds from a tornado are strong enough to lift a car and toss it a far distance. Tornadoes can and do cross major highways and interstates, as occurred during the April 24, 2010 tornado. This tornado crossed two interstates as well as at least two heavily traveled highways.

Every year, several people die from being in a car during a tornado. In 2015, one person died in northern Mississippi during the December 23rd tornadoes and nine died in cars as a result of a tornado that struck Dallas, Texas on December 26th. In 2011, 18 people were killed in cars during tornadoes, including one in northern Mississippi during the April 27th outbreak.

If traveling, make sure to adhere to the following safety tips regarding being on the road during severe weather:

- Always plan ahead. Check the weather forecast and if severe weather is expected in your path of travel, consider delaying your trip or altering your times of travel.
- Listen to live, local radio as a way to get warning information. Many radio stations will broadcast warnings within their listening area. Otherwise, consider bringing a portable weather radio and ensure that the WEA alerts are activated on your phone.
- Be aware of your surroundings and make note of any potential shelters along your route.
- Never take shelter under highway overpasses and bridges!



A vehicle mangled by an EF4 tornado in Jefferson Davis County, on April 12, 2020. Photo by NWS Jackson, MS

Enhanced Fujita Scale (EF Scale)

EF Rating	Wind Speeds	Potential Damage Threats
EF 0 (weak)	65-85 mph	Light damage, shallow rooted trees pushed over, some damage to gutters or siding.
EF 1 (weak)	86-110 mph	Moderate damage, mobile homes overturned, roof surfaces peeled off.
EF 2 (strong)	111-135 mph	Considerable damage, large trees uprooted or snapped, mobile homes destroyed.
EF 3 (strong)	136-165 mph	Severe damage, trains overturned, well built homes lose roofs and walls.
EF 4 (violent)	166-200 mph	Devastating damage, well built homes leveled, cars thrown.
EF 5 (extreme)	Over 200 mph	Incredible damage, well built homes disintegrated, automobile-sized objects thrown >300ft.

2020 Tornado Review

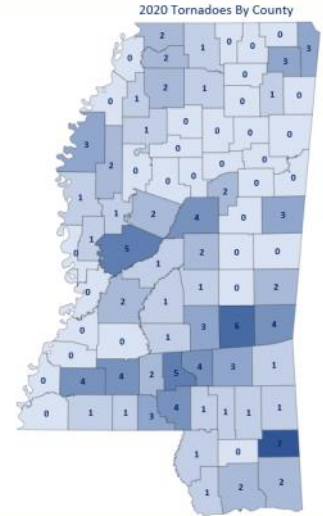
After setting a state record in tornadoes in 2019, 2020 was also an active year. Here is a look at the year in review.

- 82 tornadoes occurred. This ranks 5th since 1950 behind: 2019 (115), 2008 (109), 2005 (99) and 2011 (97)

EF Rating	EF0	EF1	EF2	EF3	EF4	EF5
Tornadoes	25	39	14	1	3	0

- 12 fatalities, and an estimated 117 injuries
- George County had the most tornadoes with 7. This is followed by Jasper County with six and Yazoo and Jefferson Davis counties with five each.

- This is the first time since December 23, 2015 there has been a violent tornado in Mississippi. 2020 saw three violent tornadoes: all of which occurred in April.
- This is the 3rd time since 1950 there have been three EF4 tornadoes to occur in one year. The other years were 1992 (one F4 in March and two F4 tornadoes in November) and in 1976 (three occurred in March).
- This is the 5th time that three violent tornadoes have occurred in the same year: 1992, 1976, 2011 and 1971.
- A new state record for tornado width was set. An EF4 tornado that tracked for 68 miles reached 2.25 miles wide in Covington County on April 12th.



The year began with 17 tornadoes that tore through mostly the northern and northwestern part of the state. During this event, there were five EF2 tornadoes. There were six injuries but thankfully no fatalities with these tornadoes. With these 17 tornadoes for the month, this was the second highest January total behind 30 that occurred in 1999.

February saw 11 tornadoes, nine of which occurred on the 5th of the month. With 11 tornadoes, February 2020 ranks 4th behind 2016 (25 tornadoes), 1971 (20 tornadoes) and 2008 (19 tornadoes). One of the tornadoes on February 5th resulted in four injuries.

April was very active with three tornadic events. The most notable event in April, with 14 tornadoes, occurred on the 12th, which was Easter Sunday. Two violent EF4 tornadoes, one EF3 tornado, and several EF2 tornadoes affected the state. For specifics on this event, please see the article on page 9. Two additional events transpired in April, with the next just a week after Easter Sunday. During this, another violent tornado, an EF4, tore across the Pine Belt for 54 miles and reached a width of 1.25 miles. One fatality and one injury occurred from this tornado. Finally, April ended with another tornado event that saw eight tornadoes, with two of these of EF2 strength. In total, 24 tornadoes occurred in April, marking it the 6th most since 1950.

Typically, summer months are quiet with respect to tornadic activity. However, not in 2020. Eight tornadoes occurred in June, remarkably not from tropical activity. These resulted from a convective system that moved across the state. This marks the most tornadoes in the month of June. However, despite the active tropics, there were only a few tornadoes that occurred from landfalling systems. As the remnants of Hurricane Laura moved through Arkansas, there was a tornado that occurred in northern Mississippi in late August. In addition, hurricanes Delta and Zeta each brought a tornado to portions of Central Mississippi in October. All three tropical tornadoes were brief and weak tornadoes.

For the second year in a row, November, our second most active month for tornadoes, only saw two tornadoes across the state. December was also quiet until an event occurred late on the 23rd into the early morning hours of Christmas Eve, which resulted in 13 tornadoes in locations from I-20 to the Highway 84 corridor. All of these tornadoes were rated EF0 or EF1 and were generally brief, but were the first tornadoes a couple of these counties had seen all year. The 13 tornadoes in December 2020 ranked 5th behind 2019 (24 tornadoes), 2008 and 1988 (16 tornadoes), and 2004 (14 tornadoes).

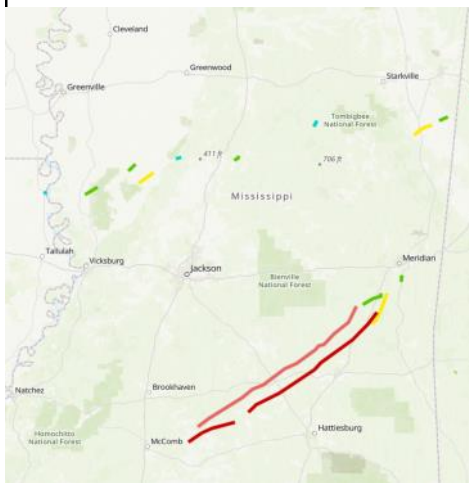
For additional information about Mississippi tornadoes since 1950, please visit http://www.weather.gov/jan/severe_statistics

2020 Easter Sunday Outbreak

An outbreak of severe weather occurred on April 12, 2020, also known as Easter Sunday. This was a multifaceted event with a few different waves of activity, each of which brought their own unique hazardous weather to the residents of the region. This outbreak produced 14 tornadoes in Mississippi. Unfortunately, fatalities occurred across the region, most of which came from the two long track tornadoes. Eleven fatalities and 105 injuries occurred as a result of the tornadoes that day, with at least two additional fatalities from straight line winds.

The first wave of severe storms moved out of northeast Louisiana as a line of thunderstorms or QLCS. The bowing segment of this line was efficient at producing tornadoes as it moved across northeast Louisiana parishes and through central sections of Mississippi before tracking across Alabama. This part of the QLCS produced 13 tornadoes across the service area with the strongest being three EF2s that occurred west of Pioneer LA, northwest of Yazoo City MS, and north of Macon MS.

The next wave was focused around two large supercell storms where each produced long track tornadoes, and were the phenomena that had the greatest impact across south and southeast Mississippi. The first storm produced two EF4 tornadoes, one of which was on the ground for 68 miles before dissipating. This long-track tornado began near Bassfield in Jefferson Davis County and tracked 68 miles across Covington, Jones, Jasper and Clarke counties. It reached up to two miles wide in several locations, with the maximum width at 2.25 miles in Covington County near Seminary, making it the widest tornado in Mississippi history. At this width, the tornado ranks 3rd widest in the official NOAA United States tornado database behind the El Reno, OK tornado of 2013 (2.6 miles) and the Hallam, NE tornado of 2004 (2.5 miles). This tornado now ranks as the widest on record in the state of Mississippi, surpassing the April 2010 tornado that tore through Eagle Lake, Ebenezer, French Camp and was its widest near Yazoo City at 1.75 miles.



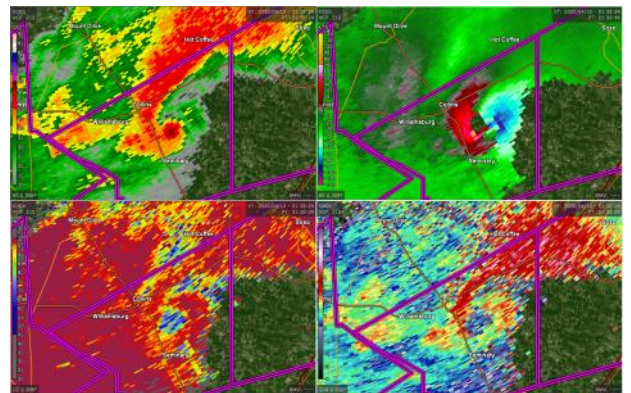
Damage estimates from the EF4 that tracked through Bassfield, MS ranks third with an estimated \$73.8 million. This falls behind the 2010 Yazoo City EF4 tornado, which resulted in \$409.5 million in damages, and the 2014 Louisville EF4 tornado that caused \$126.5 million in damages.

On the heels of this initial supercell, another supercell developed and produced a long track EF3 tornado, which was on the ground for 84 miles. These two supercells produced tornadoes within about 24 minutes of each other and their tracks paralleled each other by only a distance of five to seven miles. It is very rare for two strong to violent tornadoes to track so close to each other in both time and space. The three strongest tornadoes that day affected many of the same counties, which included: Walthall, Lawrence, Marion, Jefferson Davis, Covington, Jasper, Jones, and Clarke counties.

Tornado tracks from Easter 2020. The third and final wave was associated with the southeast surge of the cold front and driven by the strong lift and winds from the core of the upper level low. This wave was a bit unique as there were not as many thunderstorms associated with the line of strong and damaging winds. However, this line of activity produced widespread wind damage across southeast Arkansas, northeast Louisiana and all of the northern half of Mississippi, including the Mississippi Delta where winds of 70 to 90 mph occurred. While many structures sustained some sort of damage, widespread trees and power lines were blown down during the late evening and early morning hours with the final wave.



Left: Church destroyed by an EF4 tornado that tracked through Moss, MS.



Right: Radar image of the EF4 tornado that went through Covington County.



Tornado Safety Tips



When a tornado warning is issued:

- Get inside a sturdy, well built structure.
- Get on the lowest floor and in an interior room such as a hall, closet or bathroom. Get in a room that does not have any windows.
- Use something to protect your head such as a helmet, blankets, mattresses, pillows, and cushions. Use something that will provide more protection than just your hands.
- Be sure to wear shoes to avoid having to walk through any possible debris barefoot. It's also a good idea to have a whistle in your emergency kit to alert emergency officials of your location, if you become trapped by debris.
- If you are in a car: do not try to outrun a tornado. Take shelter in a sturdy building nearby. If none is available, get out of the car and get into the lowest part of the ground such as a ditch.
- Never take shelter under highway overpasses. Many are not constructed properly to provide adequate shelter, especially as the wind speeds increase as the tornado passes over.
- Mobile homes are not safe shelters. Plan to take shelter in a more sturdy building nearby or if no other shelter is available, get low to the ground in a ditch.
- For those in schools, nursing homes, hospitals, airports and shopping centers: take shelter in the designated shelter area. Stay away from large windows or glassed areas. Stay away from large rooms like dining halls, gymnasiums or warehouses because they have weakly supported roofs.

Develop a tornado safety plan **ahead of time!** Do not wait until the tornado is on your doorstep to figure out where to go, or what to do. Tornadoes form very quickly and may occur with little advance warning. You may only have a few seconds to find shelter, so it is important to know where to go and move quickly.



All that remains of this home is a safe room, after an EF4 tornado struck Moss, MS. *Photo by Andrew Phillips* (above). Two large wooden boards pierced brick walls of a building on the campus of William Cary University near Hattiesburg, MS. (left). Both of these photos show why being in the interior portion of a home/building is important, and why wearing a helmet is a good idea!

DRILL DAY
Wednesday, February 17, 2021
9:15 AM CST



A STATEWIDE TORNADO DRILL will be conducted **Wednesday, February 17, 2021, at 9:15 AM CST**, weather permitting, as part of SPRING SEVERE WEATHER PREPAREDNESS WEEK in Mississippi. *If Wednesday's weather is inclement, the test will be conducted Thursday, February 18, 2021 at 9:15 AM CST.*

The message will be sent under the Routine Weekly Test Product (RWT) disseminated by NOAA Weather Radio only. This will be broadcast on all NOAA weather radio transmitters across Mississippi. Many weather radios will alert for this test but some models will just flash a light. If your weather radio does not give an audible alert at 9:15 AM, proceed with your drill anyway.

A drill such as this gives schools, churches, businesses, hospitals, and plant safety managers across the state a chance to check the readiness of their severe weather safety plans. If your office has a plan already in place, test it to make sure your employees know how to respond properly. If your employees know how the safety procedures work, they can carry them out effectively when the time comes.

IF YOUR WORK PLACE, SCHOOL OR CHURCH DOES NOT HAVE A SAFETY PLAN, NOW IS THE TIME TO START ONE!! Developing a safety plan is not difficult. If a plan is easy to operate, it is more likely to be successful when needed. Countless lives are saved each year by planning, preparedness and proper education. The U.S. population has grown in recent years, yet the number of tornado deaths has diminished. This is due to agencies and individuals developing weather safety plans and to people reacting in a prudent manner when severe weather threatens their areas.

For information on preparing your organization :
[Preparedness Information](#)

**YOUR SAFETY AND THAT OF YOUR FAMILY, FRIENDS,
AND CO-WORKERS DEPENDS ON YOU!!!**

Graphical Tornado Database

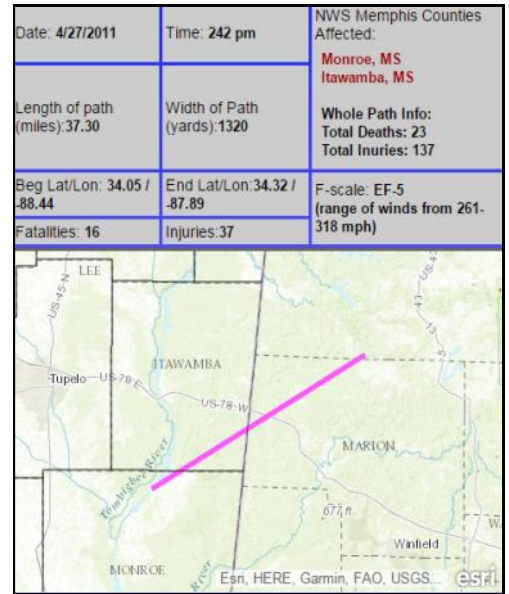
Have you ever wanted to look back at historic data to see when and where tornadoes occurred and what their impacts were? The National Weather Service has developed an easy to use, interactive tornado databases that can display tornado data going all the way back to 1880.

Figure 1 shows an example of the April 27, 2011 tornado that tracked across Monroe and Itawamba counties in Northeast Mississippi, and its impact on those counties.

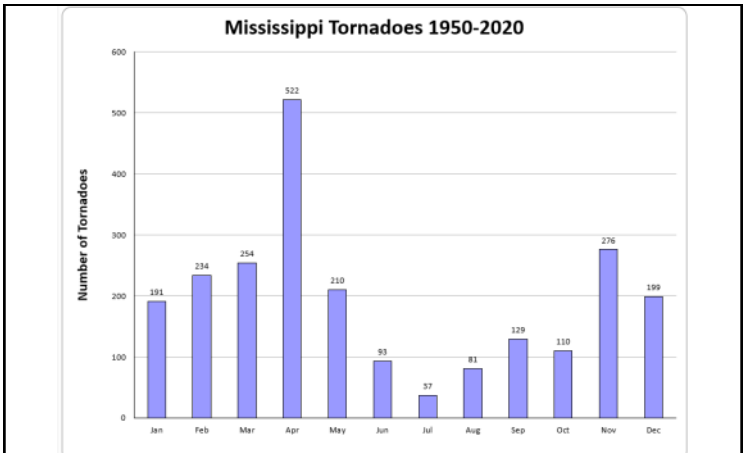
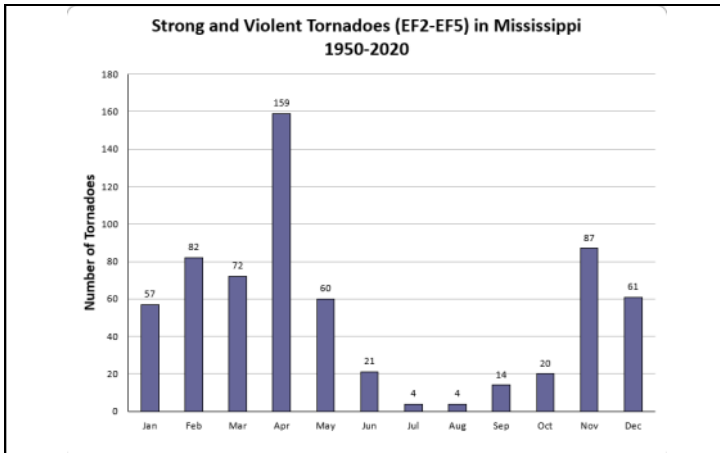
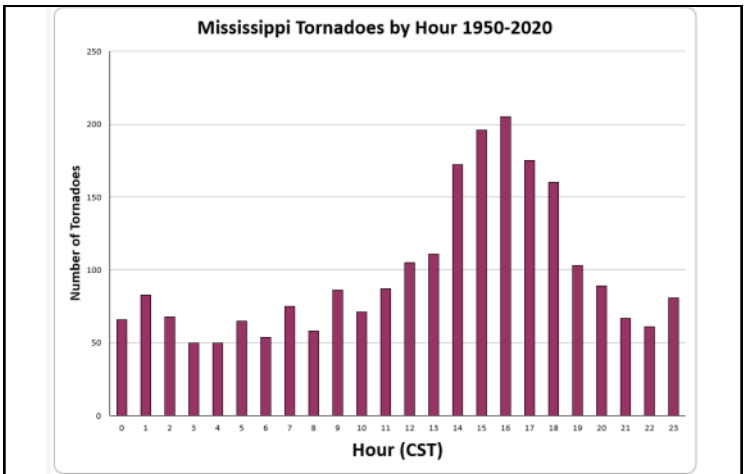
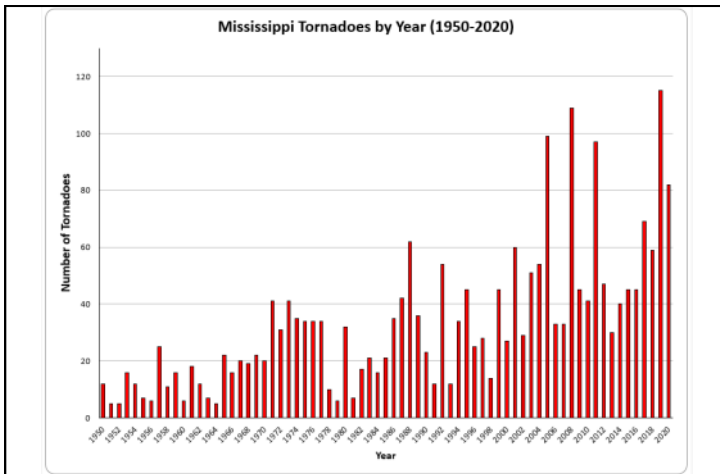
Check it out today.

To access these databases, go to the following web links:

Figure 1. Example output from the Graphical Tornado Database, of an EF5 tornado that impacted Monroe & Itawamba counties on April 27, 2011.



- Memphis (Northern MS)** – <http://midsouthtornadoes.msstate.edu/index.php?cw=meg>
- Jackson (Central and Southeast MS)** - <http://midsouthtornadoes.msstate.edu/index.php?cw=jan>
- Slidell, LA (Southwest & Coastal MS)** - <http://midsouthtornadoes.msstate.edu/index.php?cw=lix>
- Mobile, AL (Southeast MS)** - <http://midsouthtornadoes.msstate.edu/index.php?cw=mob>



Lightning

The Underrated Killer

Thursday, February 18, 2021



Lightning in Starkville, Oktibbeha Co. Photo by Trevor Birchett

EVERY THUNDERSTORM CONTAINS LIGHTNING.

Lightning is an incredibly powerful electrical discharge, containing up to 100 million volts of electrical charge and capable of reaching 50,000 degrees Fahrenheit. Cloud to ground lightning is the result of incredible differences in electrical charge which forms within thunderstorms as well as between thunderstorms and the earth's surface. Recent science suggests that ice in thunderstorms is key to creating the massive charge differences which lead to lightning. Thunderstorm updrafts and downdrafts work to separate smaller ice particles from larger hail stones within the storm. As this happens many of the ice pieces collide resulting in a separation of electrical charge. The higher part of the storm contains primarily positively charged small ice crystals, with negatively charged larger chunks of ice down low. As the storm moves across the earth, a pool of positively charged particles gathers near the ground. Eventually a brief electrical circuit is created as a negatively charged "step leader" descends from the storm toward the ground and eventually connects to the positive charge on the ground. The extreme heating of the air with lightning causes a rapid expansion of the air around it, leading to thunder. The sound of thunder will travel away from lightning at a speed around 1 mile every 5 seconds. If you can see lightning and hear thunder at your location you are not safe. If you hear thunder within 30 seconds after seeing lightning your life is in immediate danger.

Lightning Safety Rules - Outdoors

- **Seek shelter** inside a house, large building or an all metal vehicle with the windows rolled up (avoid convertibles or open top cars). It is the metal frame that protects from lightning, not the tires.
- **If your hair stands on end and your skin tingles, lightning is about to strike. Take cover immediately!**
- When boating, or in the water, head for shore and get into a shelter or vehicle.
- Once you hear thunder, stop your outside activity immediately and head for safe shelter!

AVOID

- Large trees, hilltops and other high places. Don't be the tallest object!
- Chain link fences and any other metal fences like those around ball parks and play grounds.
- Sports dugouts and open park pavilions.
- Motorcycles, scooters, golf carts, small metal sheds, bicycles, tractors and farm equipment that does not have an enclosed metal cab.



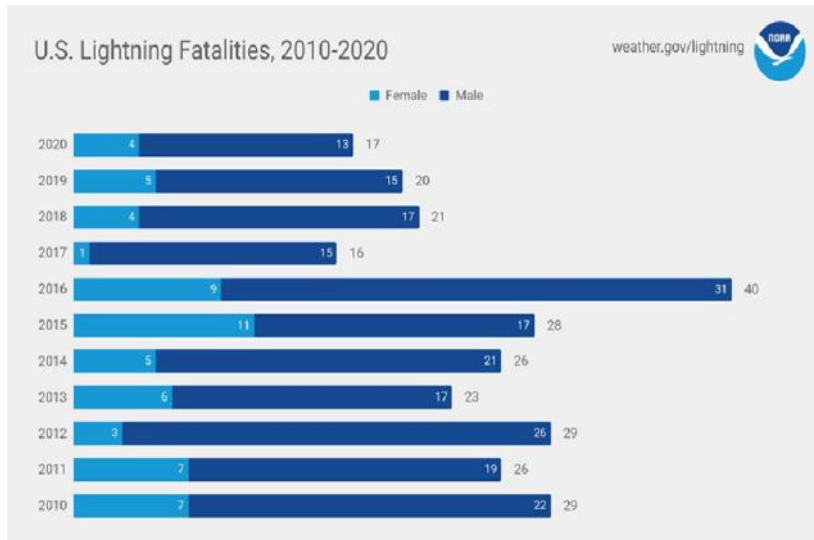
A lightning strike caused extensive damage to this driveway in Magee, MS. Photo by Chris Curlee

Lightning Safety Rules - Indoors

- **Stay away from windows.** Avoid telephones and electrical appliances (wires connecting to these devices run outside of the home and act as lightning rods). Don't wash dishes or take a shower. The pipes will conduct electricity.
- **Unplug computers** and other sensitive electrical devices (time permitting) since surge suppressors may not protect these items if lightning hits close to the home.
- **Remember, there is no truth to the old myth that "lightning never strikes the same place twice."**
- **If a person is struck by lightning, there is no residual charge left on the body. The quick application of CPR may maintain vital body functions until medical help can be obtained.**

WHEN THUNDER ROARS, GO INDOORS!

Lightning Fatalities



U.S. Lightning fatalities 2010-2020

Over the last ten years, lightning fatalities had been decreasing steadily. However, statistics continue to show that the activities performed at the time of death are those that do not provide sufficient protection from lightning. From the period 2006-2015, almost two-thirds of the deaths occurred from people enjoying outside leisure activities. These activities include outdoor sports, fishing, boating, being on the beach, camping, and outdoor recreation of many other types.

In addition, men remain by far the most likely gender to get killed from lightning strikes. This is especially the case when the activity is sports or work related. If the activity is considered a day to day activity (i.e. walking to/from the car, yard work, taking out the garbage, etc.), women are slightly more vulnerable than other activities. Overall, water-related activities (fishing, swimming, boating, etc.) remain the number one activity being performed when a lightning death occurs.

What are the factors that contribute to lightning fatalities? A study conducted by NWS Lightning Safety Specialist John S. Jensenius looked at some proposed reasons for lightning fatalities. These include:

Willingness to cancel or postpone activities

In the busy schedules of today's society, very few people like to alter their plans. Although many outdoor activities are cancelled in advance due to threat of a steady rain, few are cancelled in advance due to the threat of a potentially deadly thunderstorm. For outdoor activities, there is a balance between safety and convenience. People who don't alter outdoor plans when thunderstorms are forecast (or occurring) are unnecessarily putting themselves at risk of being struck by lightning. For any activity where a safe shelter is not readily available, there is no safe alternative but to cancel or postpone the activity in advance if thunderstorms are forecast.

Being aware of approaching or developing storms

Certain activities limit a person's ability to monitor conditions. Background noise may limit a person's ability to hear distant thunder from an approaching or nearby storm. Mountains, trees, or buildings may impair a person's view of the horizon and limit the ability to watch for signs of developing storms. Recent advances in cell phone technology and the availability of lightning notification services may help provide advance warning in these situations.

Vulnerability of the activity

Being outdoors any time a thunderstorm is in the area is dangerous. However, some activities cause people to be more vulnerable to a lightning strike, and in particular, a direct lightning strike. Direct strikes are a greater threat to people in open areas, such as sports fields or on the water.

Ability and willingness to get to a safe place quickly

The inability and unwillingness to get to a safe place in a timely manner both contribute to many lightning fatalities. Many people wait far too long to start heading to safety, and that puts them in a dangerous and potentially deadly situation. In fact, a number of lightning victims in this study were seeking safety when they were struck – the problem is that they just didn't start soon enough. In some cases, people decide to wait to see if the conditions improve rather than heading toward safety immediately. It's important to note that some activities require a considerable amount of time to get to a safe place. In those instances, it is imperative that people in charge or involved in the activities monitor conditions and head to safety immediately at the first signs of a developing storm.

Lightning is an awesome display of the power of nature and just one strike can change a life. Remember, when you can hear thunder, you need to seek shelter immediately! Situational awareness and proper planning are essential to safety from all kinds of weather phenomena.



NOAA Weather Radio / Emergency Alert System / Wireless Emergency Alerts

Friday, February 19, 2021

The National Weather Service (NWS) utilizes NOAA Weather Radio All-Hazards to broadcast continuous weather information 24 hours a day, every day of the year. This is your direct link in receiving watches and warnings from the NWS. When properly programmed, with options for single or multiple counties, the NOAA weather radio will alert you of a warning for your area, day or night. With battery back-up, the radio will still be able to deliver life-saving information even if the power goes out due to the storms. The state of Mississippi is home to 13 NOAA Weather Radio (NWR) transmitters, with some surrounding transmitters in neighboring states covering additional Mississippi counties. Approximately 95 percent of the people in Mississippi are within range of a NWR transmitter (see list of NWR transmitter locations and frequencies in table below).

While routine programming offers the latest forecasts, hazardous weather outlooks, current weather conditions, and official climate data, the broadcast cycle is automatically updated and at times interrupted whenever a specific weather watch, warning, or advisory is issued by an NWS Forecast Office. Watches, warnings, advisories and special weather statements are given the highest priority on NWR and are frequently updated with critical weather information.

In an emergency, each station will transmit a warning alarm tone in addition to the SAME (**S**pecific **A**rea **M**essage **E**ncoding) tone. Information on the emergency situation then follows. These alert tones, especially the SAME, are capable of activating specially-designed receivers by producing a visual and/or audible alarm. For the deaf and hard of hearing, special equipment is available to purchase for NOAA Weather Radio, such as strobe lights and bed shakers. Not all weather band receivers have this capability, but all radios that receive the NWR transmission can receive the emergency broadcasts. The warning alarms and SAME tones are **tested each Wednesday, typically between 11AM and noon, weather permitting.**

Commercial radio and television stations, as well as cable television companies, are encouraged to use NOAA Weather Radio in order to rebroadcast pertinent weather information to the general public. NWR is also a major part of the Emergency Alert System (EAS), which efficiently disseminates critical weather warning information through commercial broadcast outlets in order to save your life.

Wireless Emergency Alerts (WEA) are another avenue for government agencies to send urgent messages directly to cell phones in an area of interest. Applications or additional software are not needed, and the messages will look similar to text messages when they arrive on your phone. Additional information on WEA can be found at: www.weather.gov/wrn/wea

Locations and Frequencies of NOAA Weather Radio Stations Serving Mississippi

Leakesville, MS	162.425	Magee, MS	162.525
Gulfport, MS	162.400	Baton Rouge, LA	162.400
Oxford, MS	162.550	Memphis, TN	162.475
Inverness, MS	162.425	Fountain Hill, AR	162.475
Ackerman, MS	162.475	Marvell, AR	162.525
Booneville, MS	162.400	Bogalusa, LA	162.525
Rose Hill, MS	162.550	Alexandria, LA	162.475
Jackson, MS	162.400	Florence, AL	162.475
Melba, MS	162.475	Winfield, AL	162.525
Bude, MS	162.550	Mobile, AL	162.550
Carthage, MS	162.500	Demopolis, AL	162.475
Aberdeen, MS	162.450	New Orleans, LA	162.550



Wireless Emergency Alerts Expands Warning Information

Friday, February 19, 2021

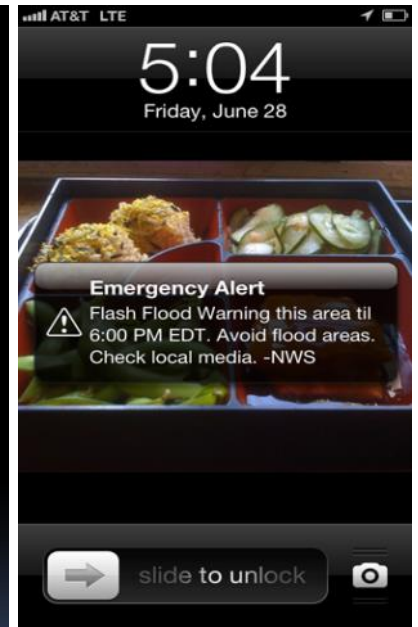
Wireless Emergency Alerts (WEA) is a public safety system that allows customers who own certain wireless phones and other enabled mobile devices to receive geographically-targeted, text-like messages alerting them of imminent threats to safety in their area. WEA enables government officials to target emergency alerts to specific geographic areas through cell towers that broadcast the emergency alerts for reception by WEA-enabled mobile devices. Wireless companies volunteer to participate in WEA, which is the result of a unique public/private partnership between the FCC, FEMA and the wireless industry to enhance public safety. Once a warning is issued from your local National Weather Service office for your geographic location, an alert tone and text message displays on your phone. There are a few types of warnings that will alert through WEA. The table displays these types of alerts and the types of messages you would see on your phone. We strongly encourage you NOT to disable any alerts as these can be life saving during times of hazardous weather!

WEA Messages Originated by NWS

Warning Type	WEA Message
Tsunami Warning	Tsunami danger on the coast. Go to high ground or move inland. Listen to local news. -NWS
Tornado Warning	Tornado Warning in this area til hh:mm tzT. Take shelter now. Check local media. -NWS -- or -- Tornado EMERGENCY til hh:mm tzT. Tornado spotted in this area. Find shelter now! -NWS
Extreme Wind Warning	Extreme Wind Warning this area til hh:mm tzT ddd. Take shelter. -NWS
Hurricane Warning	Hurricane Warning this area. Check local media and authorities. -NWS
Typhoon Warning	Typhoon Warning this area til hh:mm tzT ddd. Check local media and authorities. -NWS
Storm Surge Warning**	NWS: Life-threatening storm surge danger. Check for possible evacuation orders.
Flash Flood Warning	Flash Flood Warning this area til hh:mm tzT. Avoid flooded areas. Check local media. -NWS
Dust Storm Warning	Dust Storm Warning til hh:mm tzT. Remember, Pull Aside, Stay Alive -NWS

Legend
tzT = timezone
ddd = three letter abbreviation for day of the week

**Availability of Storm Surge Warning varies by wireless carrier



An example of a WEA message.

Current WEA Messages originating from the NWS.

The newest WEA message is that of a Tornado Emergency. A Tornado Emergency is a type of a tornado warning that is used in rare situations when a large, destructive tornado has been spotted and is an imminent threat to lives and property. WEA will be activated using special Tornado Emergency message content if a tornado warning is issued and contains the "Catastrophic" wording/IBW tag; and/or an update is issued via a Severe Weather Statement that contains the same Catastrophic wording. If the latter situation is the case, then the user may receive two separate, but distinctive WEAs for the same storm.



WEA messages save lives. This was evident in the tornado that tore through Hattiesburg and Petal during the early morning hours on January 21, 2017. At this time, broadcast sound was not working at the local TV station, and transmission of information via the local NOAA Weather Radio transmitter was off the air. WEA messages alerted residents in the path of the storm of the incoming danger and to take shelter, which indeed prompted many to do. This is an example of having multiple ways to get warning information if something should fail, which occurred in this specific tornado. Having an alert like this on your cell phone will warn you inside of the impending danger and is just another tool to use in developing a preparedness plan. This enhanced wording will only strengthen the message of incoming danger for future storms. In addition, more work is being done to include higher-end severe thunderstorm warnings, such as those that may be issued for large hail and significant wind.

Additional information on WEA can be found at: www.weather.gov/wrn/wea

Tips from *MEMA* to Help Weather the Weather

To make sure you are prepared before, during and after severe weather, be sure to have an emergency disaster kit like this one recommended by MEMA:

- | | |
|---|---|
| <ul style="list-style-type: none"> • Flashlights with extra batteries. Use flashlights instead of candles when the power goes out. • Portable radio with extra batteries. • NOAA Weather Radio. • Non-perishable food for at least 3 days. • Bottled water (1 gallon per person per day). • First Aid Kit with prescription medications. • Bedding and clothing for each family member. • Blankets and towels. • Plastic dishes/eating utensils. | <ul style="list-style-type: none"> • Baby supplies (food, diapers, medication). • Pet supplies (food, leash & carrier, vaccination records). • Toothbrush, toothpaste, soap, shampoo, towelettes, & other toiletries. • Copies of important documents such as driver's license, SS card, insurance policies, birth and marriage certificates. • Cash, enough to fill up your vehicle with gas and travelers checks. • Helmet (bicycle, football, etc.) to protect your head during a tornado. |
|---|---|

For Your Information

This booklet contains materials useful for Severe Weather Preparedness Week and other times. You're invited to contact your National Weather Service Office, state and county emergency management agency for interviews and answers to your questions. National Weather Service personnel and local emergency management are available for weather awareness programs to civic and industrial organizations, schools, hospitals, and others interested in weather safety. Each county in Mississippi is served by a designated National Weather Service office as identified below:

Please contact one of the offices listed below if you need more information.

Jackson, MS.....	Felecia Bowser.....	(601) 939-2786
Jackson, MS.....	Bill Parker.....	(601) 939-2786
Memphis, TN.....	Gary Woodall.....	(901) 544-0411
Memphis, TN.....	Jim Belles.....	(901) 544-0411
New Orleans, LA.....	Lauren Nash.....	(985) 649-0357
New Orleans, LA.....	Ben Schott.....	(985) 649-0357
Mobile, AL.....	Jason Beaman.....	(251) 633-6443
Mobile, AL.....	Jeff Medlin.....	(251) 633-6443
Mississippi Emergency Management Agency.....		(866) 519-6362

Information Resources on the World Wide Web

For additional resources, the following web sites are available:

NWS Jackson: www.weather.gov/jan
NWS Memphis: www.weather.gov/meg
NWS New Orleans: www.weather.gov/lix
NWS Mobile: www.weather.gov/mob



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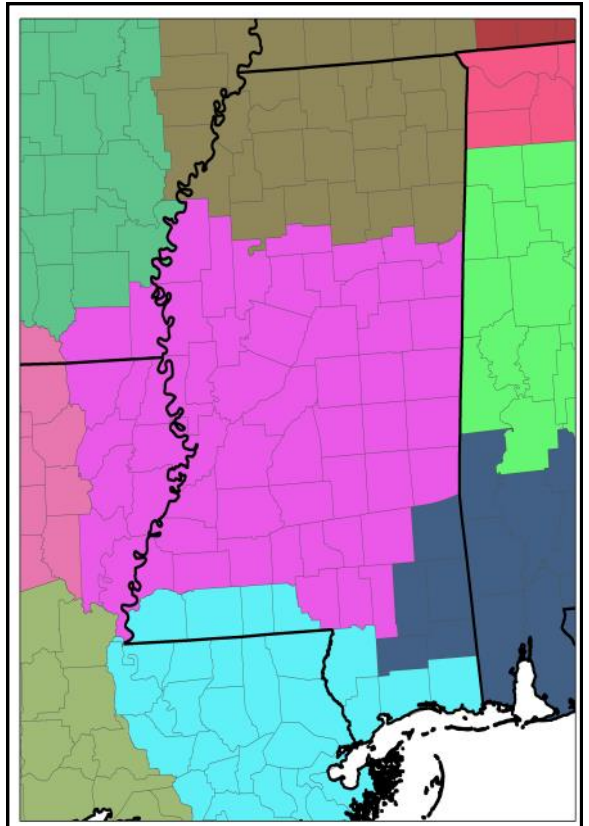
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[US National Weather Service Memphis Tennessee](#)
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Jackson, MS | Memphis, TN | New Orleans, LA | Mobile, AL

All NWS Offices:
<http://www.weather.gov>