# The ArkLaMiss Observer

*Summer 2008 Edition*

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## INSIDE THIS EDITION!



## BE CUCKOO FOR COCORAHS!

*By: Joanne Culin, Meteorologist Intern*

It sounds like a new kids' cereal, but it actually is a new phase sweeping the meteorological world. CoCoRaHS is an acronym for the Community Collaborative Rain, Hail and Snow Network. It's 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). CoCoRaHS sprouted in 1998 when a flood event occurred in Fort Collins, Colorado the year before, causing tremendous localized flooding that was not well detected by traditional weather observing networks. Local research determined that all of the rainfall missed the official reporting gauges. With CoCoRaHS, reports will provide the National Weather Service with high resolution rainfall data that we will use to provide more accurate Flood and Flash Flood Warnings. What is even more exciting is that CoCoRaHS is coming to Mississippi August 1st!

**Why do we need this?**
Precipitation is essential for life. It varies greatly with topography, storm type and season. How many times have you heard the rainfall report from an official gauge and thought to yourself: That's not what I got? Many counties have such sparse coverage of people or measuring instruments that major stroms can pass by and miss the few gauges in the area. Summer thunderstorms can dump more than three inches of rain in some areas, while areas just a few miles away receive little or no rainfall. If we want to learn more about rain storms, we need dozens of gauges in each county. With trained volunteers, CoCoRaHS helps fill these gaps and supply users with a better picture of the state's rainfall patterns. In winter months, measurements of snowfall can indicate just how sporadic snowfall can be in Mississippi. This past winter proved how widespread snowfall patterns can be in the

South. In January, while much of the southern portions of the state accumulated 1-2 inches of snow, the central and northern portions received little more than a dusting. Year round, hail can fall anywhere across the state, but there is almost no quantitative data being collected about hail. With this program, we can collect information about hail that can help with studying storm patterns.

Rain, hail and snow are easy to measure, and the data collected are very important to a wide range of occupations: meteorologists, hydrologists, engineers, water conservation experts, mosquito control, as well as scientists who research storms in order to develop new and better technology to observe and issue warnings for these storms. Even for some, like farmers and ranchers, this kind of information is important to their livelihood. In fact, this data can save lives, if reported during storm events in order to facilitate critical warning decision information just like this could have helped 10 years ago in Colorado to warn of a coming disaster.

**Who can volunteer?**
Anyone and everyone! This is the chance for all of you weather enthusiasts to help contribute to our data network and learn a little about weather all at the same time! All you need is a willing attitude to help take measurements on a daily basis between 6-9 AM, a desire to learn more about the weather and how it can affect our lives, and enthusiasm for watching and reporting weather conditions and a commitment to helping the community, the state of Mississippi as well as the country! In fact, since the inception of this organized effort, 34 states have joined and there are over 10,100 active observers already contributing to the fun! Do you live or know someone in Louisiana who would like to participate? Come on board, the fun has already started! For those in Arkansas, watch the news about CoCoRaHS coming to your state in 2009!
Every volunteer will need to purchase a 4 inch rain gauge which is available for $22 (plus shipping) from several online vendors, and an internet connection to report your observation. For more information or if you think this is for you, then log onto the National CoCoRaHS website at www.cocorahs.org, to register to become a part of this program and view the online observer training slide show to learn how to take these important measurements. For comments or questions, contact Marty Pope at the National Weather Service in Jackson at 601-936-2189 or email at Marty.Pope@noaa.gov. By banding together we can make a difference and learn a little in the process because… **EVERY DROP COUNTS!**


# CHALLENGES OF SUMMERTIME SEVERE

*By: Eric Carpenter, Senior Forecaster*

Summer brings an obvious change to severe weather patterns across the South. Cold fronts and associated thunderstorms typically seen in the fall, winter, and spring stay north of our area for the most part. Instead, heat and humidity bring an almost daily dose of isolated to scattered afternoon and evening thunderstorms from June to August. While jet stream winds and strong wind shear are often non-existent across the ArkLaMiss in the summer, we still get our fair share of severe weather. Downbursts associated with summer-time thunderstorms (*also known as pulse type storms given their short lives*) are responsible for the bulk of severe weather. The following is a description of

the downburst, and discussion on the challenges downbursts present to warning services, particularly in the new storm-based warning era.

**Description of a Downburst**

It is a hot, muggy afternoon in late July with little breeze. Towering cumulus clouds have developed into "thunderheads" and before you know it, the sky turns dark and a thunderstorm is upon you. In just a few seconds, blinding rain is accompanied by wind that seems to accelerate to hurricane strength. Lawn furniture, plastic swimming pools, and trash cans are blown down the street, and even a few trees come crashing down in your neighborhood. Then as quickly as it started, the wind and rain subside. Was it a tornado? No, it was actually a ***downburst***; one of the least recognized yet most common weather phenomena in the ArkLaMiss. So just what are downbursts and where do they originate from?

The large majority of thunderstorms that develop in the ArkLaMiss during the summer are short-lived and non-severe. They contain both an updraft and a downdraft at their peak (**Fig. 1**). Downdrafts from when precipitation can no longer be supported by the updraft, and the precipitation (rain, hail) falls bringing colder air down to the ground, where it spreads out in a divergent pattern. Typically, wind gusts of less than 35 mph are experienced where a downdraft makes contact with the ground, but

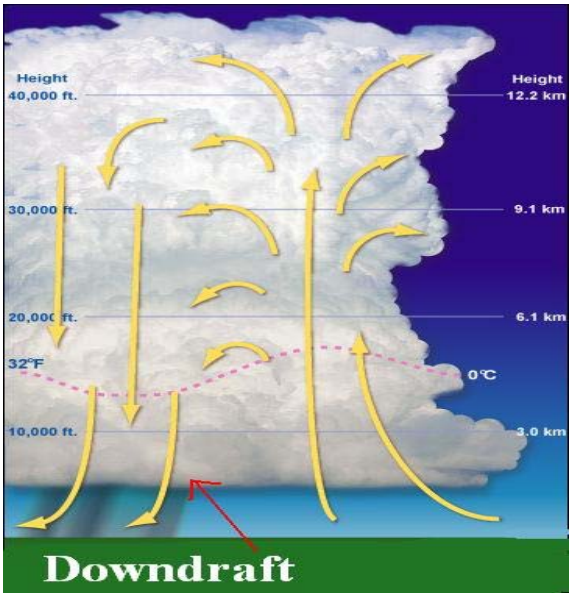



**Figure 1:** This schematic shows wind flow associated with the mature thunderstorm.

under the right atmospheric conditions, intense downdrafts known as downbursts are generated resulting in surface winds that exceed 50 mph (**Fig. 2**). In fact, winds in extreme downbursts have been known to reach 150 mph, so it is no wonder that downbursts are sometimes mistaken for tornadoes!

Based on their size, downbursts are classified as either ***macrobursts*** or ***microbursts***. Large downbursts with wind damage swaths greater than 2.5 miles are known as macrobursts, while smaller downbursts with damaging winds extending less than 2.5 miles are known as microbursts. In the ArkLaMiss, microbursts tend to be more frequent than macrobursts because summertime thunderstorms are usually disorganized. At times however, storms do become organized, and multiple downdrafts can combine to produce one larger downburst area resulting in more widespread damage (**Fig. 3**).

**Downbursts and our Warning Services**

When a severe thunderstorm warning is issued in your area

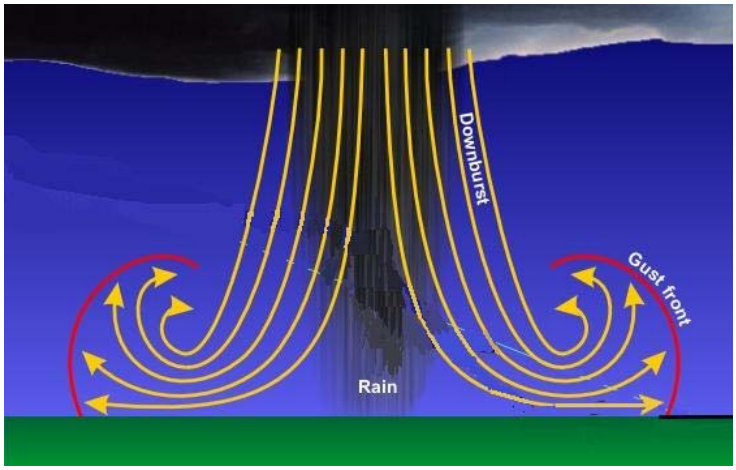



**Figure 2:** During hot summer afternoons when the atmosphere is very unstable, thunderstorms and downdrafts can become particularly intense resulting in downbursts as shown in this image.

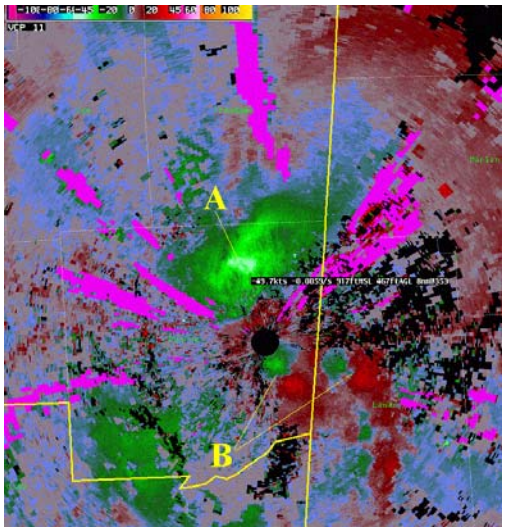


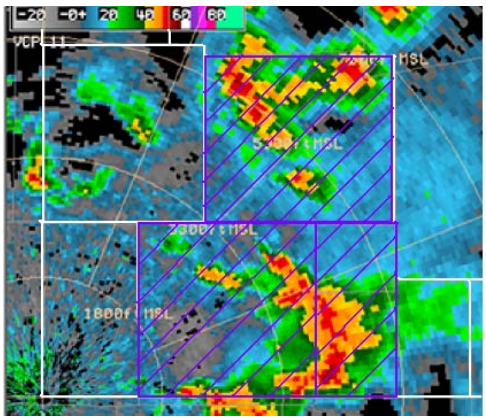

**Figure 3:** This image was taken in July of 2003 from the Columbus AFB radar. The area denoted by "A" represents a macroburst. The bright green indicates winds moving toward the radar at more than 50 mph. The features denoted by "B" are downdrafts from severe thunderstorms, with sizes more comparable to that of non-severe microburst.

during the summer, it is often the result of a microburst being detected. Doppler radar allows meteorologists to see the formation of microbursts before damaging winds can reach the ground, but there are times when smaller microbursts from smaller thunderstorms may go undetected. Our Hazardous Weather Outlook contains information regarding high potential for damaging winds (microbursts) if conditions happen to be favorable on a given summer day. Remember that intense microbursts can cause tornado-like damage! (**Fig. 4**)

The current storm-based warning system being used presents us with new challenges in regard to summertime weather. In the storm-based system, as the name implies, warning polygons are drawn based on the threat area defined by individual severe thunderstorms. Meanwhile, in the previous "county/parish-based" system, warnings were issued with respect to county/parish boundaries (**Fig. 5**). In the radar image below, there are several severe thunderstorms in what is a typical summertime environment. Note that the area being warned (area inside warning polygons) is much smaller than if entire counties were being warned and this is huge benefit. Of course, a greater number of warning can be issued when focusing on individual storms, as noted in Figure 5, and this will increase alerts for relevant


**Figure 4:** The tree damage in this photo was a result of an intense downburst. Notice the divergent damage pattern caused by the spreading out of winds. In contrast, tornadoes produce convergent damage signatures.

counties/parishes, which can give the perception of over-warning. As technology and education increase, and more people are aware of our warning polygons in the storm-based warning system, this complication will become less of an issue.



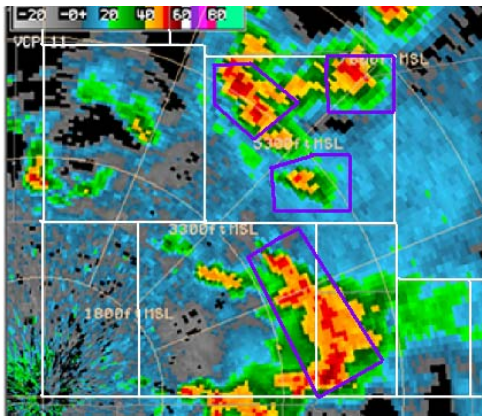


**Figure 5:** In the image on the left, hatched (purple) counties are under severe thunderstorm warnings, while in the image on the right, polygons (purple) associated with individual severe thunderstorms denote warning areas. The total "warning area" is less with the polygons, but there are more warnings.

# FIRE PLANS FOR THE ARKLAMISS REGION

*By: Marc McAllister, Journeyman Forecaster*

**State of Mississippi Fire Plan**

During the past year the National Weather Service offices of Memphis, Jackson, Mobile and New Orleans have coordinated a State Fire Plan. The plan has to do with the Fire Weather Operations that occurs across the State.

The plan includes the following elements:

1. The state is divided into 4 areas of NWS responsibility for each office.

2. The plan is single document that shows NWS duties in relation to Fire Weather Forecasting.

3. The plan shows examples of Fire Weather Forecasts for each NWS office. These are general planning forecasts for Prescribe Burning, which is the burning of areas of land in order to aid in the prevention of future wildfires. Without Prescribe Burning, the wildfires could burn underbrush, which could burn down trees.

4. The plan reveals the needed conditions for a Fire Weather Watch and Red Flag Warning, which is when dry conditions favors the development and quick spreading of forest fires. This is issued mainly for the State and Federal Fire Agencies (Mississippi Forestry Commission and the US Forest Service).

5. The plan shows how Fire Danger Statements will be issued for the public all hazards radio, when unusually dry conditions prevail in which brush or forest fires can quickly start. The statement cautions the public when doing any kind of burn bans are in effect by the county or state government.

6. The plan also shows the locations of all National Fire Danger Rating Stations, which are weather observation sites, which help to determine the fire danger of the region. It also shows forecast for each of the fire danger stations.

7. The plan also shows examples of Spot Forecasts, which are fire weather forecasts for specific sites where prescribe burns take place.

More information on the State Fire Plan can be obtained at the following link: http://www.srh.noaa.gov/jan/firewx/StateFireWeatherPlan2008-2009.pdf

**Area Fire Operations Plan for NWS Jackson, Mississippi**

This plan included the areas of extreme southeast Arkansas, northeast Louisiana and central Mississippi. It includes the same information that is covered in the Mississippi State Plan. The primary differences is that it has contact directory of our Fire Agency Customers and more detail on how NWS Jackson performs daily fire weather operations.

More information on the Area Fire Operations Plan can be obtained at the following link: http://www.srh.noaa.gov/jan/firewx/ForestryOperations2008onlineFinal.pdf

# !FUN STUFF FOR THE KIDS!

## *Weather Hazards*

*Fill in Each Space With the Most Correct Weather Hazard*
*Hurricane, Tornado, Lightning, Flash Flood, Winter Storm*

1. *The path of a _____ is sometimes narrow, but very destructive.*
2. *Usually before a _____ hits you see a funnel extending from a dark cloud formation.*
3. *Usually high towering clouds develop before a _____ storm.*

*4. A severe _____ can occur as late as April, which happened in 1982.*
*5. A _____ usually occurs in valleys where there are narrow stream beds.*
*6. A _____ is an extensive storm that usually develops in August or September.*
*7. In a _____ the most dangerous hazard may be flooding.*
*8. When a _____ approaches, go to the basement or to an inside closet or hall.*
*9. When a _____ approaches, get away from the seashore; go to a safe inland location.*
*10. Don't try to outrun a _____ in your car.*

*Answers: 1. Tornado, 2. Tornado, 3. Lightning, 4. Winter storm, 5. Flash flood, 6. Hurricane, 7. Hurricane, 8. Tornado, 9. Hurricane, 10. Tornado*

# *Reaching Out to You*

*By: Ashley Wester, Journeyman Forecaster/Editor, and Alan Campbell, Journeyman Forecaster*

Our goal here at the National Weather Service in Jackson, MS is to protect life and property. In an attempt to do this, we issue various types of watches, warnings, and advisories to alert you, the public, of impending hazardous weather that is either occurring or could possibly occur in your area. Knowing that hazardous weather is possible is one thing, but what should you do if hazardous weather is threatening you and/or your family?

When hazardous weather occurs, seconds can literally mean the difference between life and death. Staying calm and knowing the correct instructions to follow could save your life. This is why the National Weather Service in Jackson, MS believes it is important to educate people about severe weather safety and preparedness. In our efforts to accomplish this task, we offer various forms of outreach, such as talks and setting up booths at area events, just to name a few. We provide these services for any community, school, public/private group, or business that is interested in learning about severe weather safety and how to prepare for it. We also offer office tours that allow you to see what the National Weather Service is and what we do.

If you would like to schedule to have someone come and talk to your community, school, group, business, or if you would like for us to set up a booth at your next event, please contact Steve Wilkinson, Alan Campbell, or Ashley Wester. If you would like to schedule an office tour, please contact Marty Pope or Karen White. All can be reached at the National Weather Service in Jackson, MS at (601) 936-2189.


Cream: Jackson, MS service area
Blue: Memphis, TN service area
Purple: New Orleans, LA service area
Green: Mobile, AL service area

## *Thank You!*

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