# The ArkLaMiss Observer

*Fall 2006 Edition*

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## INSIDE THIS EDITION!



# El Niño Back Again!

*By: Brad Bryant, Journeyman Forecaster*

After being in a near-neutral to weak La Niña pattern over the past year and a half, sea surface temperatures in the equatorial Pacific are trending toward El Niño conditions currently. In fact, the National Oceanic and Atmospheric Administration's (NOAA) Climate Prediction Center is now forecasting moderate El Niño conditions to develop and persist into at least the Spring of next year. Around our region, a positive El Niño Southern Oscillation (or ENSO) index in the winter generally correlates to wetter and somewhat cooler-than-average conditions surrounding the event. The last moderate El Niño event occurring back in 2002 and ending in early 2003 resulted in active weather over the Arklamiss through the winter and spring months with above-average rainfall and associated periods of flooding. Figure 1 shows the detailed view of weak El Niño conditions developing through this past summer, after transitioning out of a weak "La Niña" pattern at the beginning of the year.

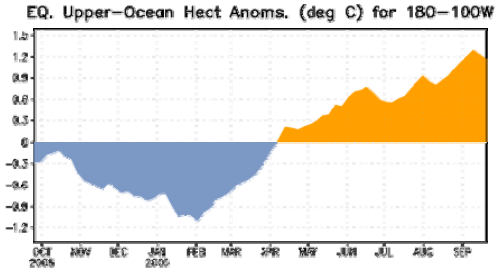



Figure 3. Anomalous equatorial upper-ocean heat content averaged over the longitude band 180°-100°W. Heat content anomalies are computed as departures from the 1982-2004 base period means.

The El Niño phenomenon of warmer-than-normal sea surface temperatures in the eastern equatorial Pacific was originally discovered by local fishermen off the western coast of South America. They found that this anomalous warming usually was most prevalent near the end or beginning of the calendar year, which subsequently gave rise to the nickname "the Christ Child". The latter phrase translates roughly to "El Niño" in Spanish. Conversely, the phenomenon of La Niña has recently been acknowledged as the reversal of El

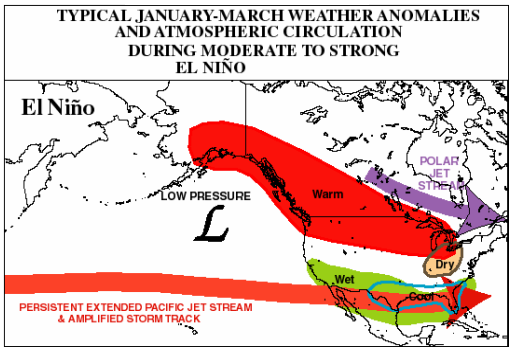
Niño conditions where waters in the equatorial Eastern Pacific are cooler-than-normal.

More recently, climatologists have noticed that sea surface temperatures in the equatorial Pacific sometimes greatly impact weather patterns across the globe. Through a complex atmospheric interaction of the oceanic heat and atmospheric energy, the southern branch of the upper jet stream usually becomes very active and displaced further south than usual during a moderate to strong El Niño event. The evolution of that upper atmospheric flow regime downstream over the Continental United States often has profound (and differing) impacts on observed weather across the nation. Similar to El Niño, a period of La Niña conditions has been shown to have implications on global climate (although those implications are generally different from its cousin). Figure 2 is an idealized graphical depiction of the strengthened southern branch of the jet stream over the North American continent during an El Niño event.

The graphic in Figure 2 also shows average departures from climatology for temperature and precipitation during a typical El Niño event of moderate to strong strength. As you can see, the region of the Deep South in the vicinity of the Arklamiss usually experiences cooler-than-average and wetter-than-average conditions during an El Niño event of at least moderate caliber. It is interesting to note that while frigid intrusions of Arctic air masses into our region are not impossible during an El Niño winter, the main cause for the cool temperatures in the Deep South with this phenomenon is because of bouts of persistent cloud cover and frequent passages of cold fronts of Pacific origin.

The sum of past recorded history with El Niño events in this region has also revealed that this pattern favors unsettled weather. The active southern storm track generally promotes intermittent risks of severe weather in the Lower Mississippi Valley throughout the cool season, especially if Gulf of Mexico waters are not greatly cooled by significant intrusions of Arctic air masses. If a good portion of the Gulf of Mexico can remain unmodified through the cool season then rich Gulf moisture will be available to contribute to enhanced thunderstorm potential as disturbances in the southern stream impact the region. Heavy rain episodes and bouts of severe weather often accompany such disturbances when potential for convection (thunderstorms) remains high. Examining climatological records for the region in the 20th century reveals that El Niño events often correlate strongly with cool seasons where regional river flooding is an issue. However, even though a moderate to strong El Niño will generally increase the risk of severe weather across the Arklamiss throughout the cool season, this same data also suggests that major tornado outbreaks in our region are more likely during a La Niña episode.

**Figure 2:**




# Longtime Jackson WCM Retires

*By: Alan Gerard, Meteorologist-In-Charge*

Longtime Warning Coordination Meteorologist (WCM) Jim Butch retired from the National Weather Service at the end of September. Jim had been the WCM at Jackson since 1994, and was one of the longest serving WCMs in the National Weather Service. In this position, Jim worked closely with emergency management and the media to enhance weather

preparedness and public safety across our region. He was the "face" of the Jackson NWS to the community we serve, and his presence in this position will be missed.

Jim began his weather career in 1970 when he served as a weather forecaster in the U.S. Air Force. After leaving the USAF in 1974, he came to work at the NWS in Jackson as a meteorological technician. He later served in a technician position at the NWS office in Athens, GA, where he also attended college at the University of Georgia. After completing his work at UGA, he completed his coursework to become a meteorologist at San Jose State University. Once this work was completed, he transitioned to a meteorologist forecaster position working at the NWS offices in Tulsa and Jackson. He became a Senior Forecaster at Jackson in 1993 before accepting the position of WCM the following year.

Over 50 of Jim's family and friends honored him with a retirement party at the Steam Room Grille in Jackson on September 28th. Many of the people who Jim worked with so closely in the emergency management community attended, including state emergency management director Mike Womack. Throughout the evening, many spoke of how Jim's efforts helped to save lives and serve the citizens of Mississippi and our surrounding states. Jim will be missed from the NWS on a day-to-day basis, but he plans to continue to remain active in the area, including continuing to remain involved with the emergency management community.

Jim Butch

# New WCM Selected Along with Other Staff Changes

*By: Alan Gerard, Meteorologist-In-Charge*

With the retirement of longtime WCM Jim Butch, an important position at NWS Jackson became vacant. This vacancy has been filled by the selection of Steve Wilkinson, a senior forecaster at the NWS office in Charleston, SC. Steve has been a Senior Forecaster in Charleston since 2001, and prior to that was a forecast at NWS Wilmington, OH for several years. He also served at NWS Youngstown, OH and NWS Greer, SC.

In addition to strong experience in severe and tropical weather, Steve is a certified Incident Meteorologist, and has extensive training in incident command structure, hazmat support, and terrorist attack support. Steve has been actively involved in the StormReady, TsunamiReady and NWS Storm Data and storm spotter programs, and has worked on a number of projects and events with emergency management and government officials at the federal state and local levels. He has won two regional level NWS Eastern Region Isaac Cline awards, one for leadership and another for his outreach work as part of a hurricane awareness tour. Steve also served in the Air National Guard from 1994 to 2000. He is a graduate of Florida State University.

Steve and his wife Wendy have 3 children and will relocate to Jackson in late November. Please join me in welcoming him to our region and our weather services team.

These are not the only changes that have been happening at NWS Jackson. A new Information Technology Officer was selected to fill behind Greg Garrett, who was promoted to our Science and Operations Officer position. Our new ITO is Mark Wilson, who previously was our Observing Program Leader. Mark has been at

NWS Jackson since 2001, and prior to that worked for the NWS in Wichita, KS and was also a weather forecaster in the U.S. Air Force. Mark brings an outstanding attitude and dedication to customer service to the position, as well as computer experience from both his NWS and USAF work.

With Mark's promotion, his position became vacant, and this was filled by the promotion of Carolyn Bryant. Carolyn has been in Jackson since 2004, and before that she was a Hydrometeorological Analysis Meteorologist at the Lower Mississippi River Forecast Center in Slidell, LA. She has extensive experience in data acquisition and analysis, and will bring this strong experience to the position of maintaining our cooperative observing network and other data acquisition programs. Carolyn has a B.S. in meteorology from the University of Louisiana-Monroe and an M.S. from the University of Oklahoma.

New WCM, Steve Wilkinson

# *Retired Longtime NWS Jackson Staffer Passes Away*

*By: Alan Gerard, Meteorologist-In-Charge*

Longtime NWS Jackson staff member Bill Knight passed away on August 21st after a short battle with cancer. He was 68 years old. Bill entered the NWS in 1977 here at Jackson as a Meteorological Technicial, and moved up to the Supervisory Meteorological Technician in 1988. With NWS modernization, he was selected as the Data Acquisition Program Manager (DAPM) at Jackson in 1994. Bill retired from the NWS in 2001, and upon retirement he became the supervisor of the FAA weather observation contract at Jackson International Airport. He held this position until he was diagnosed with cancer several weeks before his death.

While serving as the DAPM at NWS Jackson, Bill was often the public face of our office, organizing office tours and participating in outreach events. Bill was always loved by people at these types of events, and made a tremendous contribution to our office's outreach and safety programs. He will be missed by everyone in the NWS family.

# What's the Chance of Rain?

*By: Chad Entremont, Senior Forecaster*

It is one of the most popular questions meteorologists are asked. It is also one of the most widely misinterpreted, misunderstood and subjective topics out there. Additionally, when asked what it means you are likely to get just as many different answers as the number of people you ask. The question is, "What's the chance of rain?" This article is going to try and bridge the gap, develop a better understanding and bring stability to one of the most popular and widely used forecast elements the National Weather Service (NWS) provides.

The NWS began using this probability some 50 years ago and it remains a staple in each forecast today. So, what is the chance of rain? The technical term is called Probability of Precipitation (PoP).

It is defined as, the probability (expressed as a %) of a particular location receiving a measurable amount (0.01) of precipitation during a given period of time (12 hrs). For the NWS each day is divided into two periods, Today/Tonight, and each always begins at 6 am or 6 pm local time.

As you can see, the definition says nothing about how much coverage should exist, how long it will rain or the amount of precipitation, other than it needs to measure 0.01 of an inch. These are the greatest misunderstood aspects of the PoP. Just because the chance of rain is 100% tonight, doesn't mean it will rain 1-2 inches or that it will rain all night. It simply means that during the "Tonight" period, a particular location will receive at least 0.01 of an inch. As for coverage, this is implied with PoP because if you only think precipitation will be scattered across your area, you know there will be locations that get rain and others that will not. In this case you may see something like "Scattered Thunderstorms Chance of rain 50%".
What it basically boils down to is FORECASTER CONFIDENCE! With all the information and data at the hands of each forecaster, the decision ends up being, how confident am I that this/these particular locations will see measurable precipitation during a specific time period? If the forecaster is totally confident that precipitation will occur and measure, then the PoP will be 100%. Anything less suggests that something exists that offers a bit of doubt. At each end of the scale are the absolutes. 100% means you are absolutely sure measurable precipitation will occur and 0% means nothing will occur.

You may be wondering, where does the NWS start with for the PoP forecast or do they just pull numbers out of the air? We actually begin with a PoP that is generated by each computer model. These PoP values are rooted deeply in statistics and historical weather data. Each forecaster begins with these computer generated values and adjusts from there based on confidence.

The NWS in Jackson will be going through a process that will allow for changes in the way we word forecasts. This is an effort to better describe the weather for each day or period of the forecast. Look for changes to occur between now and the start of next summer.

Questions, comments, and suggestions are welcome. Email sr-jan.webmaster@noaa.gov to relay these questions to us. This topic would like to be discussed in another newsletter with the article consisting of Q & A's along with comments and suggestions from all of you.

# October 16-17 Flooding Event

*By: Eric Carpenter, Senior Forecaster*

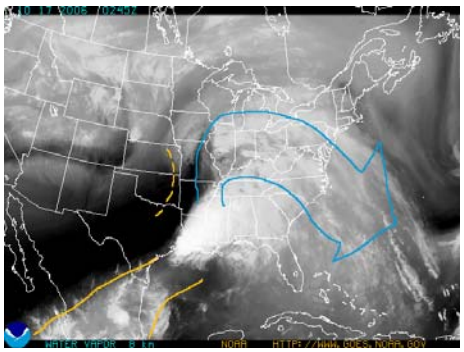
A significant heavy rain and flash flooding event occurred over much of the ArkLaMiss region this mid-October. Several key ingredients are needed to produce heavy rainfall events like the one that affected the Lower Mississippi Valley on October 16-17, 2006.

1) Great amounts of atmospheric moisture (water vapor) must be available.
2) A mechanism to "lift" and condense the moist air must exist. (eg., frontal boundaries, upper level low pressure troughs, tropical systems, etc.)
3) The moisture and lift should coincide over the same area for an extended period of time (>6 hrs).
4) If the above requirements are met and atmospheric instability is sufficient, then thunderstorms will form resulting in torrential rainfall rates (>2 inches/hr) that can produce flash flooding.

In the case of the October 16-17, 2006 heavy rainfall event, an incredible amount of tropical moisture was available over the

western Gulf of Mexico, transported from the Caribbean Sea by low-level winds, and from the Pacific Ocean by upper level winds.

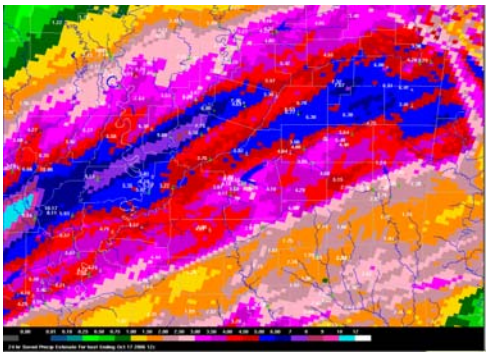
Figure 1 is a "water vapor" satellite image taken at the peak of the event early Tuesday evening at 845 pm CDT. The water vapor image represents moisture in the upper levels of the atmosphere (lighter shades). The very bright white over Louisiana and Mississippi denotes the complex of thunderstorms responsible for the flooding rainfall. The dark-shaded area west of the thunderstorm complex represents drier air that is moving in from the west.

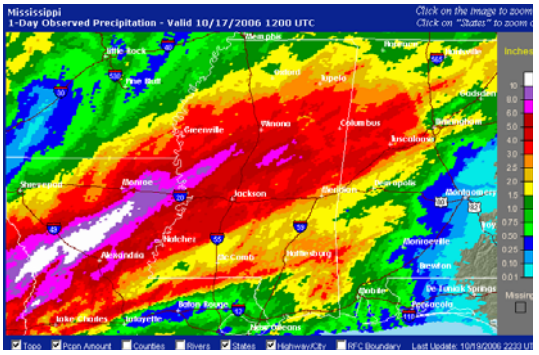


Of particular interest in this event, notice the milky color that is outlined over Mexico and the western Gulf of Mexico. This is a plume of tropical moisture that made it over the mountains from the Pacific Ocean, and it is a feature that is often associated with heavier rain events in our region. Also of interest is the anti-cyclonically curved flow over the Ohio Valley region. This represents large-scale lift associated with the upper jet stream and is also a key feature in heavy rain events.

What makes this event so rare is that such a large area received around 6 to 10 inches of rainfall, with an even larger area encompassing much of the ArkLaMiss region received 4 to 6 inches. A swath including a few locations in northern and central Louisiana received 12 to 17 inches of rainfall from this event! Looking at Figures 2 and 3, you will see an image of the rainfall received over the forecast area.

Notice the "swath" of higher rainfall amounts mentioned above. This heavy rain event resulted in widespread flooding over portions of the forecast area, mainly focusing on the parishes in Louisiana.






# !!Fun Stuff For the Kids!!

## Staying Safe During a Thunderstorm:

-If caught outside, get inside the nearest building. If there is no sturdy shelter, get inside a hard top car (not a convertible) and keep the windows up.
-Do not take a bath or shower. Unplug electrical appliances. Use phones ONLY in an emergency. Telephone wires, electrical wires and metal water pipes can carry electricity from lightning.
-If you are in a boat or swimming, get back to land immediately.
-If you can't find shelter, find a low spot away from trees, fences, and poles.
-If you feel your skin tingle or your hair stands on end, lightning may soon strike nearby. Squat low to the ground on the balls of your feet. Place your hands on your knees with your head between them.
-If you can hear thunder, **YOU ARE CLOSE ENOUGH TO BE STRUCK BY LIGHTNING!!!**

## Let's Make a Cloud

What do you need to make a cloud? In this experiment you'll create your own cloud in a bottle.

**Materials:**

-A large glass
-warm water
-scissors
-flashlight
-a large balloon
-matches

**Here's how to do it:**

1. Position the flashlight so that it shines through the jar and toward you.
2. Cut the neck off the balloon. The balloon needs to stretch across the mouth of the jar. Don't make it too tight because you need to be able to pull the balloon up, while it is still attached to the jar.
3. Take the balloon off the jar. Pour enough warm water to barely cover the bottom of the jar.
4. Light a match and drop it into the jar.
5. Stretch the balloon over the top of the jar.
6. Turn on the flashlight. Now pull up on the balloon, but don't pull the balloon off the jar. What do you see inside the jar?

**What's going on?**

When you pulled up on the balloon, you should have created a small, swirling fog in your jar. How did it get there? In the jar you had all the ingredients to make a cloud: 1) invisible water vapor in the air (that is why you added the warm water); 2) tiny particles for the water to condense onto (that is why you added the smoke); 3) a drop in pressure and temperature (that is why you pulled up on the balloon). The temperature of the air dropped because it expanded. When you pulled the balloon, up, the air inside the jar had more room. To fill that extra room it had to expand. When air expands it cools, and when air cools it might form a cloud. When you released the balloon the cloud disappeared. This is because the pressure and temperature of the air inside the jar rose, and the liquid water in your cloud went back to being invisible water vapor.

# Reaching Out to You!

*By: Ashley Wester, Editor/Journeyman Forecaster 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, warning, 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 in your area 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 hot 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 Alan Campbell or Ashley Wester. If you would like to schedule an office tour, please contact Patsy Peden. 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

**Some of our recent events:**

October 18-19, 2006: Meteorologists Alan Campbell and Ashley Wester attended Marion County's Farm Safety Day to speak to approximately 400 5th grade students about severe weather safety.
October 3, 2006: Meteorologist Eric Carpenter and Service Hydrologist Marty Pope went to Oakdale Elementary School to speak to 120 4th grade students about severe weather safety.
September 28, 2006: Meteorologist Ashley Wester went to Madison Avenue Upper Elementary to speak to 120 5th grade students about severe weather safety.
September 18, 2006: Meteorologists Ashley Wester and Latrice Maxie went to the Museum of Natural Science to hand out resources to area teachers at the annual Back to School Night.
September 8, 2006: Meteorologist Alan Campbell went to Brandon Elementary to speak to 25 4th grade students about severe weather safety.

# Thank You!!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