THE TEXAS THUNDERBOLT

SPRING 2008

NATIONAL WEATHER SERVICE -- FORT WORTH, TX
SERVING ALL OF NORTH TEXAS
WWW.WEATHER.GOV/FORTWORTH

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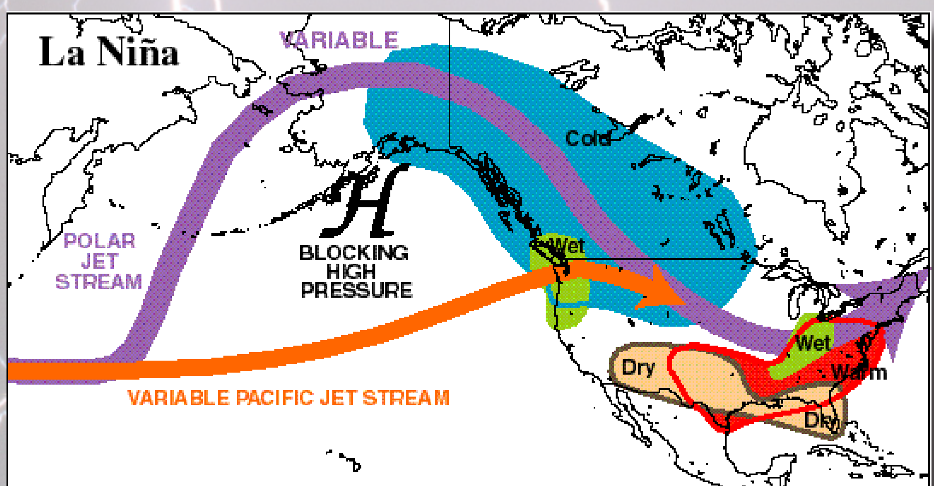
A La Niña Fire Season

by Daniel Huckaby

Abundant rainfall during the spring and summer of 2007 brought an end to the worst drought in decades, but precipitation deficits made a rapid return late in the year. Extensive vegetation growth during the time of ample rainfall became dry kindling during the dormant winter months that followed. Fanned by strong winds and aided with seasonally low humidity, wildfires consumed over half a million acres across Texas during January and February.

The last time North Texas experienced a fire season of this magnitude, the winter of 2005-2006, the region was suffering through a similar lack of rainfall. That winter was also the last time La Niña conditions prevailed in the equatorial Pacific. Although thousands of miles from Texas, the heat content of the Pacific Ocean can have far-reaching impacts.



Above: Winter jet stream patterns associated with La Niña events. Note dry weather over much of the southern U.S. during these winters. NOAA image.

The El Niño/Southern Oscillation (ENSO) has been observed for centuries. As recently as the 19th century, scientists noted predictable relationships between changes in water temperatures in the equatorial Pacific and weather aberrations on opposite sides of the ocean basin.

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A La Niña Fire Season

Continued

During El Niño conditions, the typically cool waters of the eastern Pacific warm. Those who fished the waters adjacent to Ecuador and Peru noticed that dramatic changes in the fish population coincided with the warming. The onset of an ENSO warm phase often occurs around Christmas, and as a result, the anomaly was named El Niño after the Christ child.

In recent decades, El Niño events have been correlated with numerous weather anomalies in far reaching parts of the globe. The waters of the tropical Pacific account for a massive surface area. Slight changes in sea surface temperatures affect the heat content of the air above. That affects winds and associated weather patterns, which in turn creates a cascading effect of altering the weather on a global scale. Although global weather has countless inputs unrelated to ENSO, which can render our predictions of typical outcomes inaccurate, an El Niño event can certainly increase the likelihood of expected departures from climatological normals.

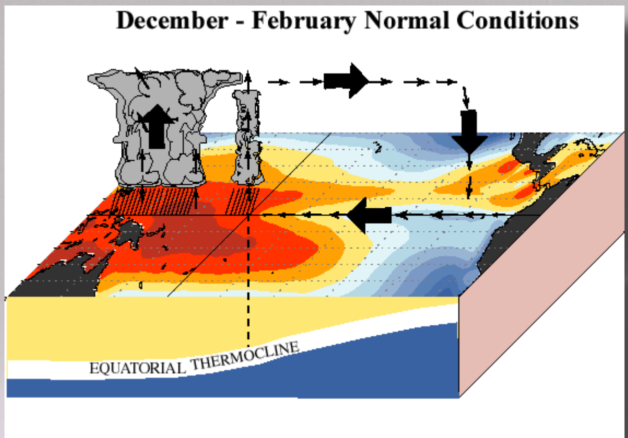
La Niña events are marked by cooler than normal sea surface temperatures in the equatorial Pacific. Stronger than normal trade winds blow the cool water near South America into the typically mild waters of the Pacific. During La Niña winters, the jet streams across the northern Pacific are often disrupted in a similar way, typically resulting in warmer temperatures and reduced precipitation across much of Texas. The winter of 2007-2008 certainly fit the expected pattern as Texas experienced one of the more significant fire seasons in recent memory.

Want to Know More?

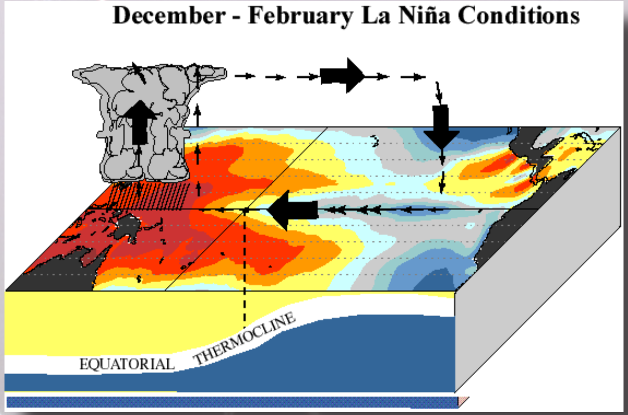
Visit our ENSO website at weather.gov/fortworth/enso.html

Did You Know?

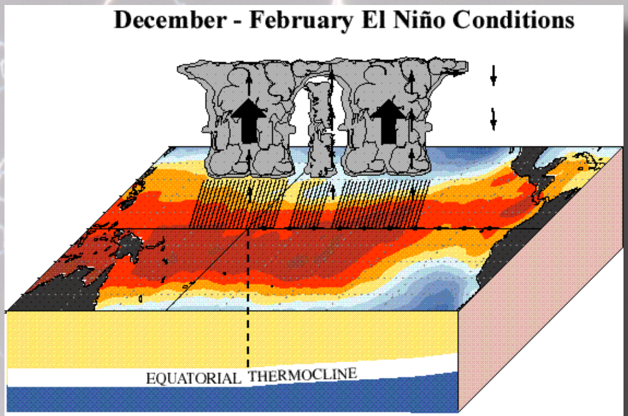
According to the Texas Forest Service, the severity of this year's fire season is one of the worst seasons on record. Since January 2008, fires have consumed over 500,000 acres and destroyed 300 structures; however, an estimated 5,622 structures were saved. Governor Perry has issued state disaster proclamations for 216 of the state's 254 counties in response to fires.



Above: Water temperature and atmospheric circulation during normal conditions. NOAA image.



Above: Water temperature and atmospheric circulation during La Niña events. NOAA image.



Above: Water temperature and atmospheric circulation during El Niño events. NOAA image.

WES Used to Train Forecasters

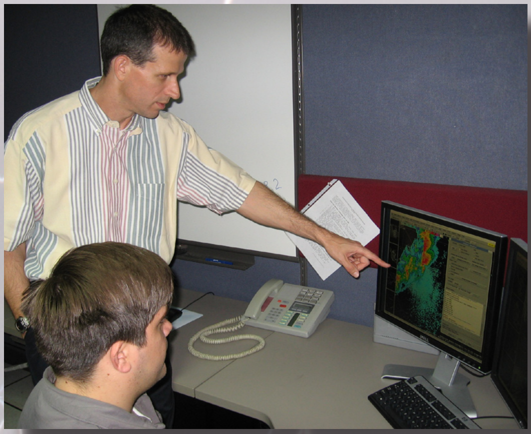
by Nick Hampshire

Pilots, astronauts, and doctors are some professionals that use training simulations to prepare for situations that may arise in the performance of their duties. Meteorologists at the National Weather Service also "train as they fight" by accomplishing training exercises that simulate real-time cases. The NWS office in Fort Worth uses a Weather Event Simulator (WES) that enables forecasters to sharpen their skills with regard to severe weather or flooding. The WES workstation is configured exactly the same as the operational workstations where real-time warnings are issued. The primary difference between the WES and an operational workstation is that the ability to transmit or broadcast watches, warnings, or statements has been disabled in the WES. Since the WES is a virtual workstation, the skills, abilities, and lessons learned during training translate directly into the real-time environment.

Several times each year, meteorologists participate in training exercises which consist of displaced real-time simulations on the WES. These simulations can be a tornado outbreak, large hail event, significant flash flooding, or any combination of events. Simulations enable the NWS forecaster to keep their radar interrogation skills and warning decision-making abilities fine-tuned. Research has shown that practice in a simulated environment translates into results during an actual event. By practicing warning decision-making using the WES in a low-stress situation, forecasters are often more comfortable making decisions during stressful events.

When a significant weather event occurs across North Texas, Science and Operations Officer Greg Patrick saves all available data for the event. Data DVDs are used to store the event data, which can then be moved to the WES. "The WES is my single biggest training and research tool", says Patrick. "The ability for our forecasters to practice their skills on an off-line workstation has been a valuable training device for forecasters at all experience levels."

When it is time for a training exercise, Greg will configure the WES to play a past event that each meteorologist in the office can complete. To supplement the local North Texas events, other archived events from across the country can also be played back on the simulator. The non-local events provide a means to expose forecasters to different weather situations that may occur only rarely across North Texas.



Above: Greg Patrick (standing) and Nick Hampshire work on the WES.

Special Thanks

NWS Fort Worth would like to say Thank You to the Skywarn Team volunteers who staff radios at the NWS, to the media and EM partners, and to the spotters in the field for their efforts. Over the past few months, the Skywarn Team worked numerous 12+ hour days, the media and EMs were valuable in relaying and disseminating information, and the spotters provided critical ground-truth reports. Thanks to all for helping us keep North Texans safe!

Storm Spotter Training 2008 Wraps Up

by Thunderbolt Staff

After three months, over 50 stops, and nearly 7,000 miles of travel, the National Weather Service's North Texas Skywarn tour came to a conclusion in early April. The tour featured spotter traning programs, coordination visits with local media and emergency management staffs, and training programs for emergency communications personnel. Many of the NWS staff members were involved with the 2008 tour, either directly or in a support role.

Gary Woodall, Warning Coordination Meteorologist at NWS Fort Worth, was pleased with the tour. "We had good crowds at most of the programs", Woodall stated. Over 3,600 amateur radio operators, law and fire officials, city and county workers, and interested public attended the programs. "A considerable number of the attendees had not been to a spotter program before, and many of the first-timers expressed an interest in becoming active spotters for their area."

Woodall noted that the media and emergency management visits were benficial. "The severe weather warning process is a team effort", he said. "Our media and emergency management partners are vital in getting the word to the public. The pre-season coordination visits allowed us to ensure that our contact procedures, collaboration tools, and methods to relay information were ready to go."

We have already seen benefits from the tour. On March 31, a severe thunderstorm moved through western and northern portions of Lampasas County. The storm was a supercell with large-scale rotation and it produced large hail east of Lometa. At times, the images from the Doppler radar near Granger suggested that the storm was trying to develop low-level rotation as well. The meteorologists in Fort Worth were considering upgrading the Severe Thunderstorm Warning to a Tornado Warning. However, four storm spotters with amateur radio capability were watching the storm from close range. They reported no formations or features suggesting that a tornado was imminent from the storm, and we held off on the warning upgrade. This prevented a "false alarm" tornado warning from being issued.

What's Next for the NWS Outreach Team?

After the peak of severe weather season, the team will participate in the Ham-Com amateur radio convention and several safety events over the summer. Then, it will be time to review the 2008 season and start planning for the 2009 awareness campaign.

Looking for a Speaker?

NWS Fort Worth meteorologists are available to speak with civic organizations, schools, and companies on severe weather safety and planning. Our presentations are free of charge, but may be cancelled on short notice due to impending hazardous weather across North Texas.

Contact Gary Woodall if you would like to schedule a speaker or tour of our facility.
Email: Gary.Woodall@noaa.gov

Above: Rainbow captured outside NWS Fort Worth. NWS Photo.

Staff Spotlight
Al Moller, Senior Forecaster
Serving North Texas for over 34 Years

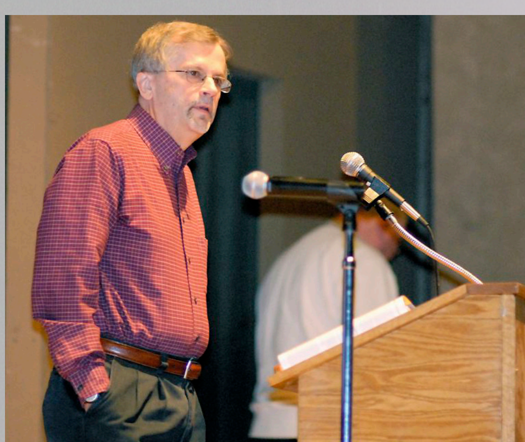
Al Moller is one of the most familiar names within the North Texas weather community. He has dedicated over 34 years to weather forecasting and research, safety presentations and Skywarn, and storm chasing and photography.

Above: Al working the forecast desk.

Al's fascination with weather began at a young age, and he has been hooked on it ever since. As a boy, he would climb on his father's roof in southwest Fort Worth to watch storms on the horizon. He also searched libraries and book stores for every available read on weather.

He enjoyed playing baseball as a boy, and noticed a thunderstorm in the distance one afternoon while playing center field. Staring at the lightning bolts, Al heard the crack of the bat. He missed the ball and his coach was upset with him. Al said, "I should have known then that I wasn't cut out for major league baseball, it was meteorology all the way."

Al studied engineering for two years at the University of Texas at Arlington before transferring to the University of Oklahoma for meteorology. He obtained his B.S. degree in Meteorology in 1972 and a M.S. in 1979. For his master's research, Al studied tornado outbreaks of the southern plains.



Above: Al speaking at a local Skywarn event in early 2008. Photo by Sam Barricklow, K5KJ

During his time at OU, Al was a part of a group of students who would storm chase in order to assist university and government scientists with research. The students would take note of cloud structures, formations, and capture tornadoes on film. Their accounts would be compared with radar data collected by the National Severe Storms Laboratory to gain insights in severe storm and tornado evolution. Al's chase group was among the first in the country to correlate visual observations with radar data.

Having worked for the NWS since 1974, Al has spent all of his career at NWS Fort Worth aside from a brief departure to NWS Lubbock from 1978 to 1979. He has held his current position as senior forecaster since 1982.

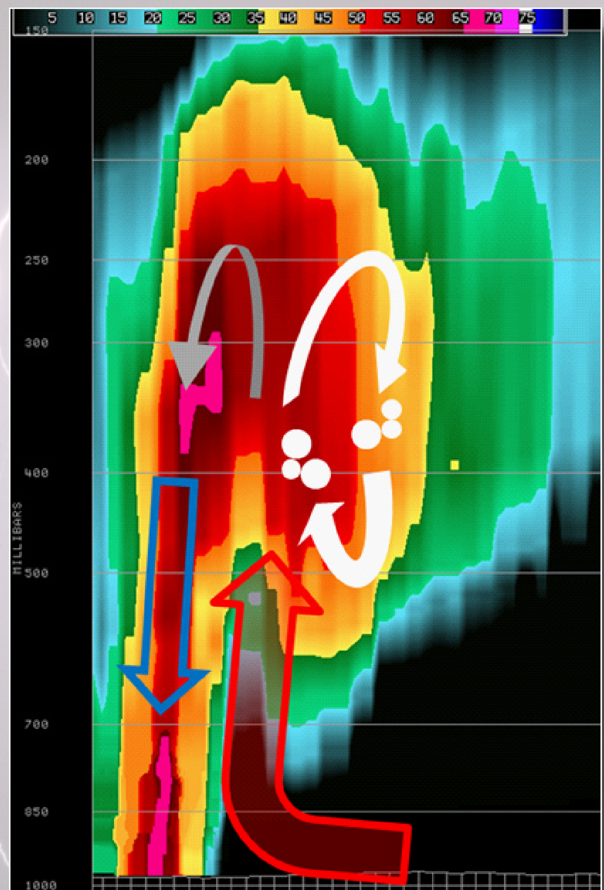
Over the past 34 years, Al has given more than 1000 Skywarn and weather safety presentations to law and fire officials, emergency management personnel, and the general public.

DR. WEATHER'S WISDOM

ALL ABOUT HAIL GROWTH

BY: TED RYAN

Meteorologists at the National Weather Service use Doppler radar to monitor thunderstorms and issue warnings when large hail becomes likely. To determine hail size, forecasters need to look at the 3-dimensional radar structure of the storm. A radar cross section, which is like a virtual "x-ray" that shows the inner workings of a storm, gives clues about how large the hail may be.



Above: Radar cross section of a severe thunderstorm.

In the image to the right, a severe thunderstorm is sliced down the middle. The ground is at the bottom of the image, and the top of the storm reaches almost 10 miles high. The updraft of this storm is indicated by the red arrow. This updraft carries tiny water droplets from near the ground to several miles above the surface, where the droplets freeze. The vertical wind speeds of a strong updraft can sometimes reach over 100 mph! As the updraft reaches the top of the storm, it begins to weaken and the ice particles start falling back toward the ground.

Some of the ice particles get stuck in a cycle (shown by white arrows) where they fall a couple of miles, but get caught in the updraft again and are lofted upward. This cycle causes these ice particles to spend a long time inside the storm where they are constantly accumulating ice and growing into large hailstones.

At times, the infant hailstones are sent to an area of the storm where they get caught in a downdraft (or downward air current) and fall to the surface as small hail or raindrops (shown by the blue and gray arrows).

The hailstones that continue to cycle up and down eventually become so massive that the updraft can no longer lift them and they fall to the ground as very large hail. The largest hail stone ever measured fell near Aurora, Nebraska in 2003. The stone measured 7.0 inches in diameter and weighed 1.67 pounds!

Right: Hail stone from Aurora, NE in 2003 measuring 7.0 inches in diameter. NOAA photo.