



SKY SCOOP



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DROUGHT IN THE MIDDLE OHIO VALLEY

After 1996, 1997 and 1998 brought major to even record flooding to portions of the Ohio River Valley, 1999 brought a hydrologic extreme not seen in several years: drought.

While the drought was not apparent until the summer of 1999, it began very subtly in late 1998. During the fall of 1998, precipitation over the area ranged from 70% to 85% of normal, largely due to the extremely dry months of September and November. These dry conditions slowly began to deplete ground water and resulted in slight drops in well levels. While the winter of 1998-1999 was actually characterized

by above normal precipitation, the precipitation was not enough to bring soil moisture and well levels back to normal. Winter precipitation often falls on frozen ground and has a tendency to run off directly into creeks, streams and rivers (not absorbing into the soil). When spring precipitation (which is essential for recharging soil moisture and well levels) was only 60% to 75% of normal, the growing season was faced with a much drier than normal soil. The summer months would have to provide enough rainfall to bring recovery. Unfortunately, one of the driest summers this century occurred.

The summer months resulted in rainfall only 70% to 85% of what is normally expected. Temperature was a huge factor in fueling the drought. June and July brought many days of temperatures in the 90s and 100s. These hot temperatures increased evaporation rates. As a result, soil and lower atmospheric moisture were low. When sporadic rains developed over the region, much of the rain went into saturating the atmosphere. Thus, little rain reached the surface. Since summertime thunderstorm development is dependent on low level atmospheric moisture, areas lacking in low level

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WHAT IS ALL THE TALK ABOUT LA NIÑA?

(Information for this article was taken from <http://www.cpc.ncep.noaa.gov>. Please refer to this web address for a detailed explanation of El Niño and La Niña.)

Most of you by now have heard of the word "El Niño." However, it has been El Niño's

sister, "La Niña" that has had a direct influence on the weather pattern across the United States this winter.

El Niño (warm ocean water) and La Niña (cold ocean water) episodes are the two extremes of what is called the El Niño/Southern Oscillation (ENSO)

cycle. This cycle encompasses changes in ocean surface and subsurface temperatures, tropical rainfall, atmospheric winds (jet stream) and air pressure. The cycle has an average time frame of about four years, although the period has varied between two and seven years based on

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SEVERE WEATHER IN THE FALL AND WINTER?

On October 13th 1999, a vigorous cold front swept into the region, causing severe weather in Ohio. On that day, a tornado touched down in the city of Circleville. Significant damage occurred in the north central part of the city. Several homes were destroyed. Also, trees were uprooted, and carports were torn from homes. Tornado winds were estimated between 158 mph to 206 mph, making this tornado an F3 on the Fujita Scale. On January 3rd 2000, warm, moist air surged northward into the region. This

warm, moist airmass in early January was responsible for severe weather across the region. In particular, Pendleton County, Kentucky was hit hard by severe

Severe weather can happen anytime of the year. We always need to be on our guard. Thank you spotters for the good work!!!

thunderstorm winds. Most of the damage was located three to five miles west of Butler, Kentucky.

Several structures received damage. Many trees were blown down. Winds were estimated between 60 mph and 75 mph with brief higher gusts near 90 mph.

When we think of severe weather, we usually think of the spring and summer months. However, two events this past fall and winter remind us that we need to be on our guard for severe weather the whole year through.

By Scott Hickman



The Circleville tornado blew this large tree on top of garage. This photograph was taken by Hydrometeorological Technician Mike Gallagher.

NEW NOAA WEATHER RADIO TRANSMITTER

During 1994, Vice President Al Gore declared an initiative to provide a national upgrade and enhancement of the NOAA Weather Radio (NWR) transmitter network. The initiative would be with the cooperation of the National Weather Service, Department of Agriculture and the Federal Emergency Management Agency. In addition, public and private partners of the state, county and local governments would be involved. The goal of this initiative was to reach at least 95% of the nation's population with NWR.

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Continued Drought

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moisture were unable to produce significant thunderstorm activity. In other words, the drought became self-sustaining.

Several counties across the middle Ohio Valley were declared federal disaster areas as a result of the drought. The agricultural community was hit hard. Crop loss was widespread. Livestock had to be liquidated to alleviate the strain on water supplies. Furthermore, pasture areas dried up, forcing farmers to use part of their winter supply of

hay to feed their livestock.

While portions of northeast Kentucky and south central Ohio saw some relief during August, central and southwest Ohio, southeast Indiana and northern Kentucky saw their rainfall deficits increase. The May 1999 through December 1999 precipitation amounts ranged from 10 to 16 inches below normal for much of central and southwest Ohio as well as portions of northern Kentucky. Other areas within the middle Ohio Valley had deficits from 4 to 10 inches.

The NWS Climate Prediction

Center outlook for April through June calls for precipitation to be below normal with above normal temperatures. The precipitation deficit that began in 1999 still exists. While this area is not the main concern for drought intensification in the U.S., if the forecast for April through June is observed, there may be some drought recurrence.

By Julie Dian-Reed

Continued La Niña

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historical records.

During La Niña episodes, the equatorial Sea Surface Temperature (SSTs) are colder than normal from the international date line eastward to the west coast of South America, and tropical rainfall and thunderstorm activity tend to be focused over the western equatorial Pacific and Indonesia. Little rainfall is evident over the eastern equatorial Pacific, as SSTs remain well below 82 °F in this region throughout the episode.

Like El Niño, La Niña affects the atmospheric circulation patterns across North America. In particular, the strength of the

jet stream can be highly variable, with the mean jet position usually entering North America in the northwestern United States/southwestern Canada. This has been the case this past winter. This jet stream pattern allows for large parts of central North America to experience increased storminess, increased precipitation and an increased frequency of significant cold-air outbreaks. On the other hand, the southern United States experiences less storminess and less precipitation. Also, there tends to be considerable month-to-month variation in temperature, rainfall and storminess across central North America during the winter and spring seasons. This is in response to the more variable atmospheric circulation throughout the period. In fact, the Climate Prediction Center

feels that this La Niña episode will last through the first half of this year.

So what will La Niña bring to our area this spring? Current long range forecasts call for above normal temperatures and below normal precipitation. As stated before, the variability of a La Niña makes it difficult to know what the severe weather season (springtime thunderstorms) will bring. Only time will tell. One thing is for sure: We depend on you, our spotters, to help us during severe weather outbreaks. Keep up the good work!

By Scott Hickman

Continued NOAA
Weather Radio

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In Ohio, a decision was made to place a transmitter in Scioto County. The State of Ohio Emergency Management Agency has played a major role in the installation of this new transmitter which will be in Otway (about 15 miles northwest of Portsmouth). The new transmitter site will operate on 1000 watts of power with an assigned frequency of 162.525 MHz. The tower and antenna have already been installed. The transmitter is expected to be installed late this year. By then, weather information should be broadcast within a 40 to 50 mile radius of Otway.

By Samuel McNeil

Floods and flash floods are the number one weather-related killers in the United States. In fact, about 80% of flood deaths occur in motor vehicles. It only takes about two feet of water to float most cars.

SEVERE WEATHER SAFETY TIPS

With the approach of the severe weather season, it is always a good idea to review severe weather safety tips.

Tornado Safety Tips

1. Have a plan. Meet with household members to discuss how to respond to a tornado warning. Hold tornado drills.
2. The safest place to be during a tornado is underground. If you have no basement or cellar, go to a small room (such as a closet) in the middle of the building on the lowest floor. Try to find something sturdy to crawl under.
3. Never try to outrun a tornado. A tornado can toss cars and even large trucks around like toys. If you are caught outside or you are in your vehicle, seek safe shelter. If no shelter is available, lie down in a low area using your hands to cover the back of your head and neck. Be sure to stay alert for flooding.

Lightning Safety Tips

1. Seek shelter inside a building (not a shed).
2. If lightning is occurring and a shelter is not available, get inside a hard top automobile and keep the windows up.

3. If no automobile is available, find a low spot away from trees, fences and poles. Be alert to the possibility of flash flooding.

4. If you feel your skin tingle or your hair stand on end, squat low to the ground on the balls of your feet. Place your hands on your knees with your head between them.

5. If you are boating or swimming, get to land and find shelter immediately.

Flood Safety Tips

1. About 80% of flood deaths occur in motor vehicles. Never attempt to drive into a flooded roadway. It only takes about two feet of water to float most cars.

2. If you live in a low-lying area or near a creek, pay close attention to water levels during heavy rain events. Water rises rapidly during flash floods, often taking victims by surprise. Be prepared to move quickly to higher ground if water levels begin rising rapidly.

3. Never let children play near creeks or storm drains. Every year, deaths or injuries occur as a result of people getting swept into a creek or storm drain, with most of the victims being children.

RIVERS AND CREEKS OVERFLOW THEIR BANKS IN OHIO AND KENTUCKY

Two heavy rainfall events occurred in February across the Tri-State region. These events not only resulted in flooding, but they also reduced the rainfall deficit and improved drought conditions over much of the area.

The first heavy rainfall event occurred on February 13th. A stationary front just south of the Ohio River produced heavy rain across northern Kentucky, southeast Indiana and southwest and south central Ohio. One to three inches of rain fell, causing creeks, streams and even some rivers to come out of their banks. Many roads were covered by water. Although this was a

significant event, it only set the stage for a much bigger event on February 18th.

On the 18th, a strong low pressure system tracked along the Ohio River. Showers and thunderstorms containing heavy rain fell across the same areas that received heavy rain on the 13th. Widespread two to four inches of rain fell across these areas with some localized spots in northern Kentucky receiving nearly six inches. Numerous roads were flooded, and many structures were damaged, especially in Mason and Lewis Counties in northern Kentucky and Scioto County in south central Ohio. At least 400

people were evacuated to escape rising water in those counties.

As a result of the flooding in February, southeast Indiana, southwest Ohio and northern Kentucky have returned to near normal conditions for long term precipitation. East central Indiana and central Ohio, on the other hand, remain in moderate drought conditions.

Below is a table that displays those rivers and creeks that crested above flood stage between February 18th and February 21st. A photograph depicting the flood can be seen on page 6.

By Steve Wilkinson

River/Creek	Crest	Time/Date	Flood Stage
Little Miami at Kings Mill	17.2 feet	905 pm/February 18	17.0 feet
Little Miami at Milford	17.7 feet	1000 pm/February 18	17.0 feet
Ohio Brush at West Union	24.5 feet	745 am/February 19	15.0 feet
Hocking at Enterprise	15.0 feet (estimated)	900 am/February 19	12.0 feet
Licking at Falmouth	36.7 feet (estimated)	900 am/February 19	28.0 feet
Scioto at Piketon	26.5 feet	Midnight/February 20	18.0 feet
Ohio at Cincinnati	54.5 feet	1057 pm/February 21	52.0 feet



This photograph taken near downtown Cincinnati shows how the water from the Ohio River flooded this restaurant's parking lot. The photograph was taken by Jeff Dobur from the Ohio River Forecast Center.

TORNADO SAFETY AND OVERPASSES

There have been some recent articles regarding safety and highway overpasses during a tornado. Several problems have been documented with taking shelter up underneath highway overpasses. The most common is a funneling effect which can develop as the tornado winds flow under the overpass. This funneling effect can actually cause the wind to increase an additional 25% under the overpass. During the event, you are exposed to flying debris. Several people have actually been blown out from underneath the overpass. More information on this topic can be found at

www.nwsnorman.noaa.gov/papers/overpass.html

This article contains detailed pictures and diagrams explaining the problem for those interested.

If you are caught in the open during a tornado, then you must understand there are no good shelter options available. The best safety rule to follow is not to put yourself in that position. Easier said than done. During a tornado watch, you need to be proactive by keeping a watch on the sky and obtaining severe weather information from the nearest National Weather

Service office. When the warning is issued, you should carry out a prearranged safety plan.

If you are caught in the open, and there is time, leave your vehicle for a permanent building and take shelter in a basement if available. Otherwise, move to the interior portions of the first floor and put as many walls between you and the outside as possible. If this is not possible, there are not many options left. Vehicles can roll over or become airborne and are not good tornado shelters. It is

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IMPORTANT INFORMATION FOR OUR SPOTTERS

Another severe weather season is upon us, and soon spring storms will be rolling across the area. That is why it is important to have trained spotters in the field. We are currently holding spotter training classes across southwest Ohio, northern Kentucky, east central Indiana and southeast Indiana through April. There are about four classes a week, so there will likely be one in your area soon. Feel free to attend one if it has been a while since your last training class, or if you would like to recruit family and friends into the spotter program. Your participation is vital to both the Weather Service warning program and the safety of your community. This article will give an overview of our new spotter training program, and it will review the types of weather you should report.

If you attended one of the early training classes in February, you know we have upgraded our training program. We now use a laptop computer and projector instead of the slides of the past. This has improved the clarity of the pictures and will improve everyone's ability to see the program. We have also tried to improve the flow of the program and have included some new information. If you would like to attend one of the upcoming training classes, check our website at the following address: www.nws.noaa.gov/er/iln. You

can also call our office. For those of you who attended previous classes, please let us know what you think of the new program.

As I mentioned earlier, severe weather season is here. Thus, spotters need to always be on the lookout for inclement weather. How do you know when to expect severe weather? On days that severe weather is more likely to occur, we try to alert our spotters by issuing a special weather statement hours before severe weather is expected. This statement is broadcast on NOAA weather radio as well as posted on our webpage. It tells when and where severe weather is most likely to occur and what types of severe weather to expect. If conditions continue to look favorable for widespread severe weather across the area, the Storm Prediction Center (SPC) will issue a watch. However, much of our severe weather is localized. The only clues to impending severe weather development will be statements or warnings issued from our office or by spotters observing signs of severe weather.

What kind of weather should you report? As you learned in the training class, tornado and funnel cloud reports are very important. How do you know if what you see is a funnel cloud?

The most important aspect is *persistent rotation*. Watch the funnel or wall cloud for five to ten minutes to help determine if it is **the real thing**. It is also important to report hail one half inch in diameter or greater, downed trees or large limbs and damage to structures.

One of the most forgotten severe weather phenomenon is flooding. As we saw earlier in February, flooding can be very devastating. Flash flooding kills more people each year than any other severe weather element. If you receive an inch of rain or more in an hour, witness high water on roads or overflowing streams, please forward the information to us.

Once you have witnessed some severe weather, how do you report it? Call the spotter reporting line and give your spotter ID, location and the time and type of event. Be as concise as possible so other reports can get through. Remember, the **toll-free number is only for severe weather reports**. If you have a question or need general weather information, call (937) 383-0031. Amateur radio Skywarn spotters reporting through the Net do not need to use their ID numbers.

There will be times when we may need to call you. Someone

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Continued Spotters

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from the office might give you a call during the times you indicated that you were available. If this happens, they will typically ask for specific information such as how much rain has fallen or if you are experiencing hail or strong winds. In addition, we might call after a storm has moved through your area (even the next day) to inquire about possible damage. These reports are still important. The information will help us verify warnings as well as provide information for post-storm analysis. Remember, you

are providing a critical service to both the NWS and your community. However, **DO NOT PUT YOURSELF IN HARM-S WAY. PLEASE PUT YOUR SAFETY FIRST.** Do your spotting from somewhere safe and take cover if threatening weather is imminent. Thank you again for your participation in the Skywarn program. The National Weather Service appreciates the valuable information you, our spotters, provide.

By Shannon White

Continued Overpasses

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recommended that people abandon vehicles and seek shelter in a ditch or low area. There are dangers associated with this action as well. You can become exposed to flying debris, and flooding may be a problem in low areas. Seeking shelter in a ditch is only recommended as a last resort.

Remember, have a safety plan. Be alert for warnings. Keep your eyes to the sky and avoid being caught in the open.

By Mary Jo Parker

2000 WILMINGTON NWS SKYWARN SPOTTER UPDATE

Name (s) _____

Wilmington Spotter ID (s) _____

Do you need a new ID Card? _____ If so, who? _____

Address _____

street address and/or PO Box

apt #

city

state

zip

Telephone ____ (____) _____

County of Residence _____

Distance and Direction from the Nearest City or Town and/or nearest US, state or county highway.

Is this a new address? If so, what was your previous address?

Would you like to receive notification of our newsletter via email? If so, what is your email address?

Date of talk last attended _____

Affiliation, if any?

Emergency Management _____

Amateur Radio (with ID) _____

Law Enforcement _____

Fire/Rescue Squad _____

Other _____

1. May we call you for verification of suspected severe or hazardous weather events?

*Please give a time duration, otherwise we will assume that we can call anytime day or night.

Times: From _____ AM PM to _____ AM PM

2. Do you own any weather observing equipment? _____

Wind Gauge _____ Thermometers _____

Rain Gauge _____ Other _____

Signature _____ Date _____



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