



Summer 2008
Volume 6, Issue 3

Inside this issue:

Camping Weather Safety 1

June 2008 Flooding in Northern Illinois 2

The Hot, Dry Summer of 1988 5

Super Resolution Doppler Radar is Here! 9

Summertime is Severe Weather Time: Weather Safety at Home 10

Camping Weather Safety

by Tim Halbach, Forecaster

From Spring through Autumn, a major recreational activity that many people across northern Illinois and Indiana enjoy is camping. Whether you are camping in a Recreational Vehicle or a tent, there are some basic weather safety guidelines that you should follow every time you camp to make sure you and your family or friends are safe.

Severe Weather

All campers should have a battery powered NOAA All-Hazards Radio along with them to monitor what is happening with the weather. Severe thunderstorms and tornadoes can occur at any time during the day or night. Listening to the Hazardous Weather



Outlook portion of the radio broadcast will inform you of when the best chances for the severe weather will occur and where. Always keep the power to your NOAA All-Hazards Radio on so that if a Severe Thunderstorm Watch/Warning or if a Tornado Watch/Warning is issued, it will alarm immediately with the latest information. The quicker that you receive the warnings; the quicker you can react and take the necessary precautions. Upon arriving at the campground, know the quickest route to the campground shelter house. Stay away from any chimneys as the bricks or large stones from these chimneys can topple inward if any damage is sustained to the shelter. If no shelter is available and a severe thunderstorm or tornado approaches, lie flat in a nearby ditch or depression and cover the back of your head with your hands. Do not get into your automobile as a strong wind can easily turn it into a projectile. Be aware of flying debris as most fatalities and injuries from tornadoes or straight-line winds are a result of the debris. Lying flat in a ditch or a depression will be your best chance to avoid this dangerous flying debris. RV's, trailers, and tents can be flipped or destroyed by severe thunderstorm winds or large falling tree limbs.



Lightning

About 80 people die and about another 300 are injured every year due to lightning. Most of these deaths and injuries occur when people are outdoors during the summer. Lightning strikes can occur up to 10 miles away from the rainfall of a thunderstorm. Even though it may not be raining, you still can be struck. To get a general estimate on how far away the thunderstorm is, count the number of seconds between a flash of lightning and the next clap of thunder. Divide this number by 5 to determine the number of miles away the lightning is. The safest place to move to if a thunderstorm approaches is the shelter house. But if you have been listening to your NOAA All-Hazards radio and know that the storm is not severe, take shelter in a hard-topped car with the windows up and do not touch any metal in the car. If you are away from your car or a shelter, find a low spot away from trees, fences and poles. If you are in the woods, take shelter under the shorter trees as lightning tends to strike the tallest object available. 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 ears and your head between your knees. Make yourself the smallest target possible and minimize your contact with the ground. DO NOT lie down. An Open structure such as a picnic shelter might keep you dry for a few minutes, but offers no protection from lightning.

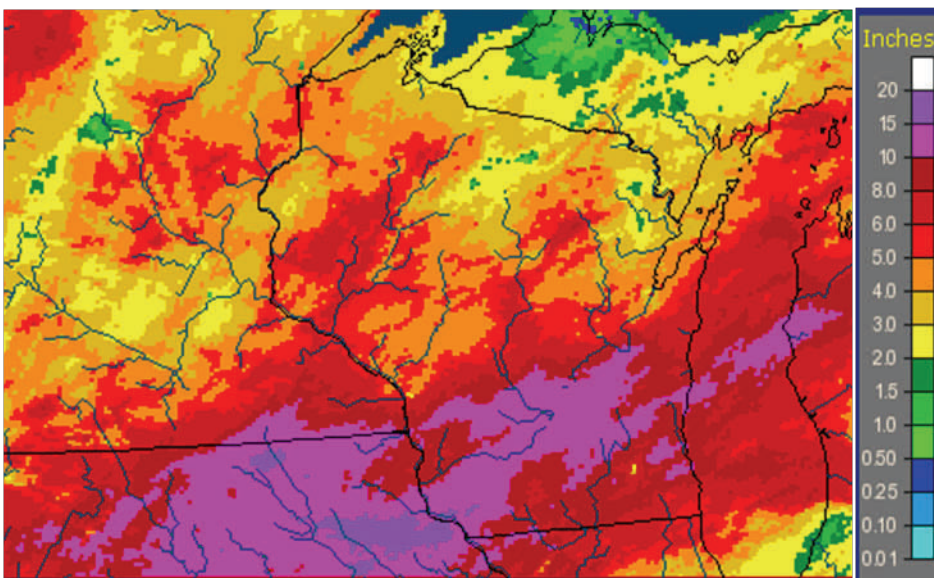
Flash Flooding

When camping, you should avoid setting up camp next to streams, creeks or rivers as heavy rainfall upstream can cause the river levels to rapidly rise. Rises may occur without any rain even occurring where you are at. If water levels were to rapidly rise, do not try to outrun the surge of water. Instead, climb up to higher ground. 6 inches of fast moving water is enough to knock a person off of their feet. Most victims of flash floods are drivers, so if you leave your campsite early due to heavy rain, do not drive through flooded roadways. Water two feet deep is enough to displace a motor vehicle.

June 2008 Flooding in Northern Illinois

by Bill Morris, Service Hydrologist

Torrential rainfall occurred in early June over portions of central and southern Wisconsin. The headwaters of the Fox, Des Plaines, Pecatonica, and Rock rivers are located in areas of southern Wisconsin that was hard hit by heavy rainfall. The image below depicts 30 day rainfall ending on June 20, 2008 over far northern



Illinois, Wisconsin, Iowa, and Minnesota. Note the extremely heavy rainfall of 10+ inches over some areas.

30 day rainfall ending June 20, 2008

As floodwaters moved downstream, rises began on rivers in northern Illinois including the Fox, Des Plaines, Rock, and Pecatonica Rivers. Extensive flooding occurred along portions of these rivers with hardest hit areas including the upper Fox River in the Chain of Lakes area, and the Rock River in Machesney Park. Most of the upper portions of these rivers were in flood by the second week of June. The Rock River at Rockton, IL experienced the second highest crest on record. The U.S. Geological Survey streamgauge station at Rockton was established in 1903.

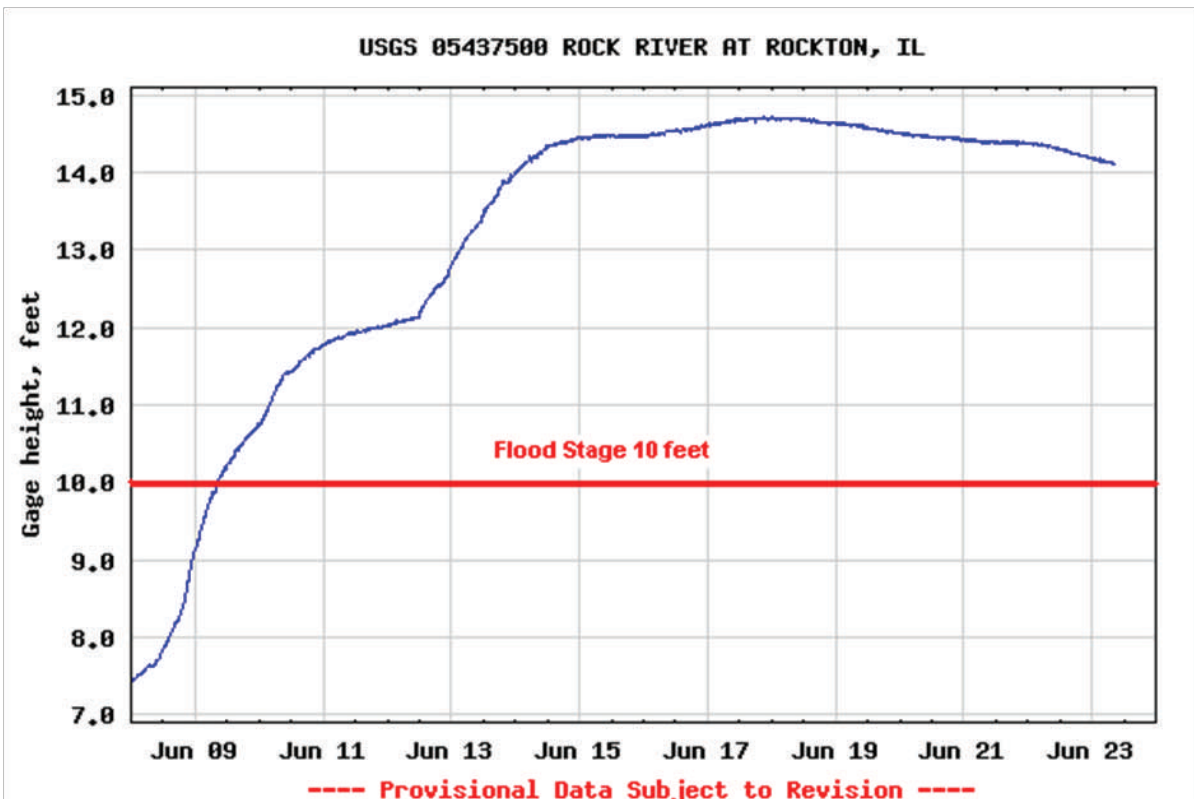
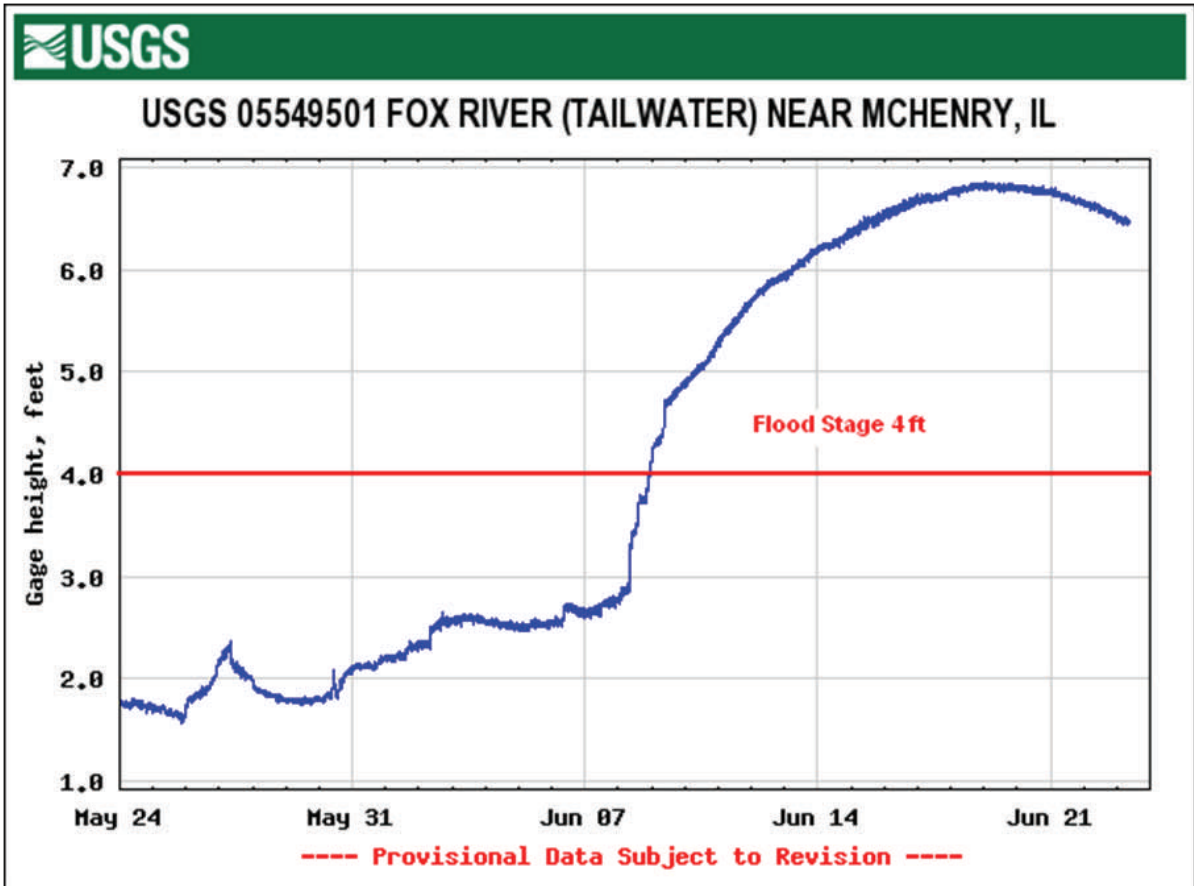
At the time of writing in late June, river levels had crested but remained above flood stage and continued a very slow fall.

Flood Impact Information

The National Weather Service uses impact statements to describe what is flooded at a given river stage. For example, an impact statement may indicate that at 10 feet, Main Street floods. This information allows emergency managers, agencies involved in flood fighting, and residents in affected areas to estimate the severity of an expected flood. Impact information is listed on the hydrograph pages from the [Advanced Hydrologic Prediction Service](#) (AHPS) page. Please notify [Bill Morris](#), the NWS Chicago Service Hydrologist if you have any additions or corrections to our existing flood impact statements.



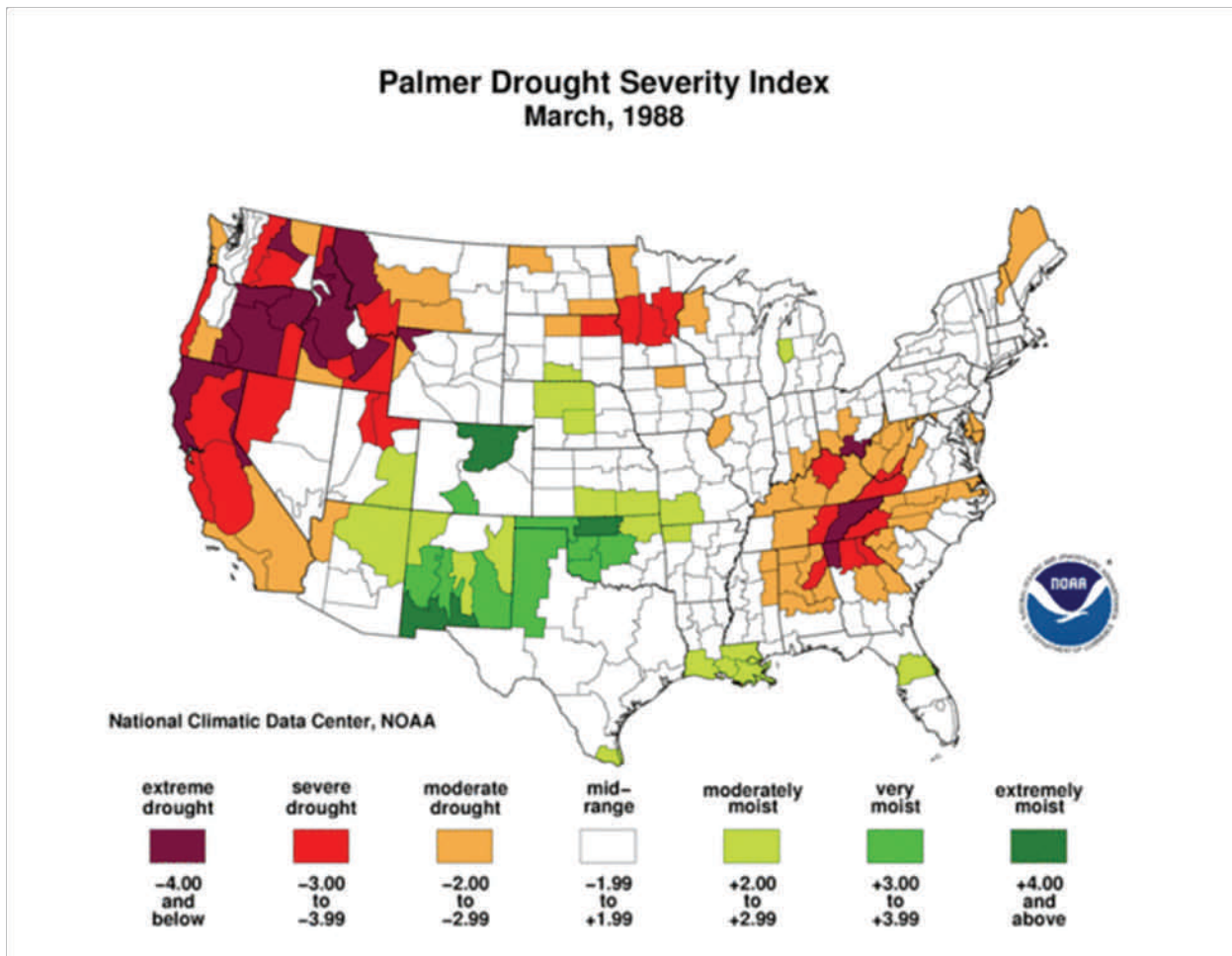
Flooding along the Rock River near Machesney Park. June 2008.



The Hot, Dry Summer of 1988

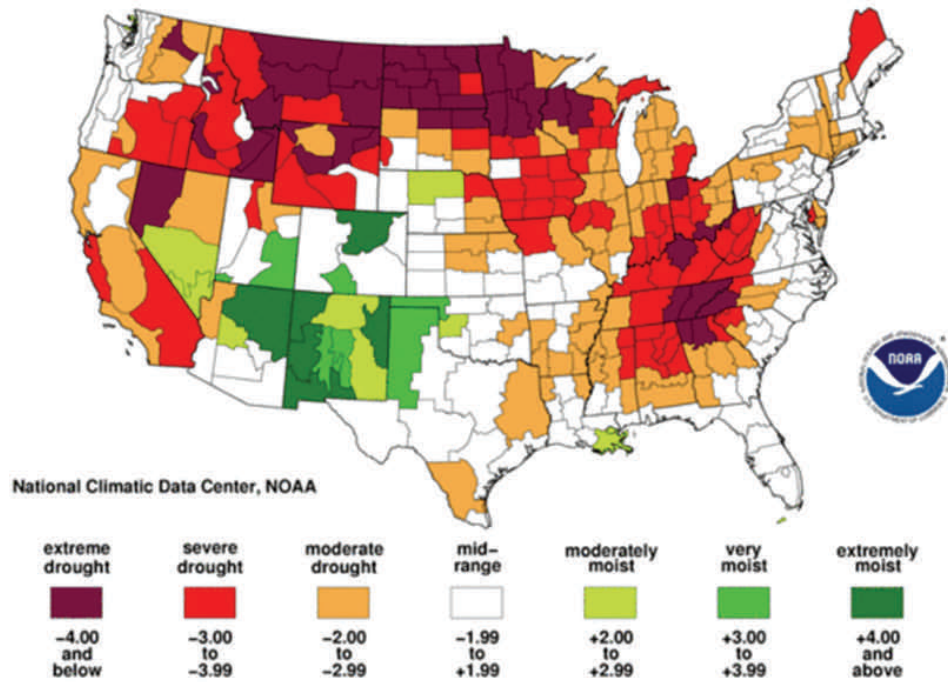
by Jim Allsopp, Warning Coordination Meteorologist

Twenty years ago the central and eastern U.S. suffered one of its worst droughts. The drought cost the nation an estimated 40 billion dollars (62 billion in 2007 dollars) in losses – the costliest in U.S. history. The drought began in the northwest, and northern Great Plains, and portions of the Tennessee Valley and Appalachians in the spring. It spread across much of the central and eastern part of the country by summer. The drought was accompanied by intense heat. It is estimated that 5,000 to 10,000 people lost their lives due to the heat and drought.



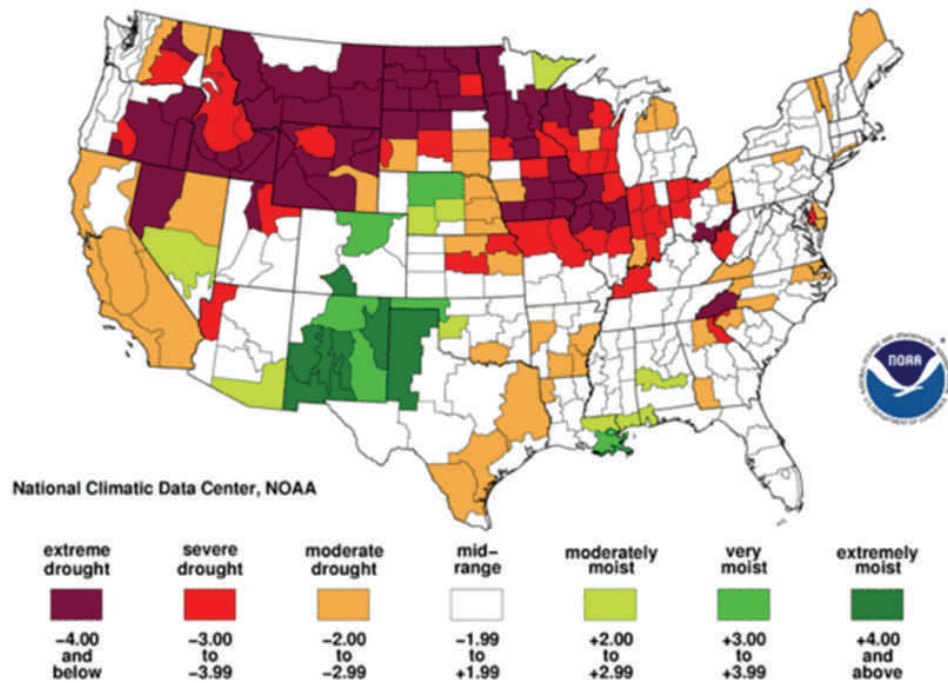
Palmer Drought Severity Index for March, 1988, from NOAA's National Climatic Data Center

Palmer Drought Severity Index June, 1988



Palmer Drought Severity Index for June, 1988, from NOAA's National Climatic Data Center

Palmer Drought Severity Index September, 1988



Drought Severity Index for September, 1988, from NOAA's National Climatic Data Center

In addition to the obvious losses to farming, the drought had a significant impact on transportation. According to Stanley Chagnon of the Illinois State Water Survey, low flow on the Mississippi River cost the barge industry about a billion dollars. A proposal to divert water from Lake Michigan was met with opposition from other Great Lakes states.

The dry conditions also resulted in widespread forest fires over the western U.S., including the devastating fires at Yellowstone National Park.



Fire approaches Old Faithful complex. Courtesy Jeff Henry, National Park Service

In northern Illinois and northwest Indiana the drought severely impacted the corn and soybean crops. Here are some statistics for Chicago and Rockford;

Chicago 1988

Month	Avg Temp	Departure from Normal	Precipitation	Departure from Normal
March	38.1	+0.8	2.15	-0.50
April	48.2	+0.4	2.08	-1.60
May	61.0	+1.3	1.19**	-2.19
June	71.7	+3.5	1.05***	-2.58
July	76.8	+3.5	2.74	-0.77
August	76.8*	+5.1	3.29	-1.33
September	65.9	+2.1	3.79	+0.52

*6th warmest August
 **9th driest May
 ***9th driest June

Rockford 1988

Month	Avg Temp	Departure from Normal	Precipitation	Departure from Normal
March	36.2	+1	2.15	-.24
April	47.7	-.2	3.14	-.48
May	62.5	+2.9	1.29**	-2.74
June	71.3	+2.5	.46***	-4.34
July	76.5	+3.6	2.39	-1.71
August	76.4*	+5.5	1.96	-2.25
September	65.3	+2.5	2.29	-1.18

*5th warmest August

**8th driest May

Chicago set a record for the most 90 degree days in a year (47) and greatest number of 100 degree days in a summer (7). There were back to back 100's on three separate occasions. The 104 recorded on June 20 was the second highest temperature ever recorded at the official Chicago observatory.

Rockford had seven 100 degree days, but that pales in comparison to the 100 degree days racked up during the blistering Dust Bowl summers of 1934 (eleven 100 degree days) and 1936 (fifteen 100 degree days). There were forty six 90 degree days in Rockford, which is tied for the 5th most in a year.



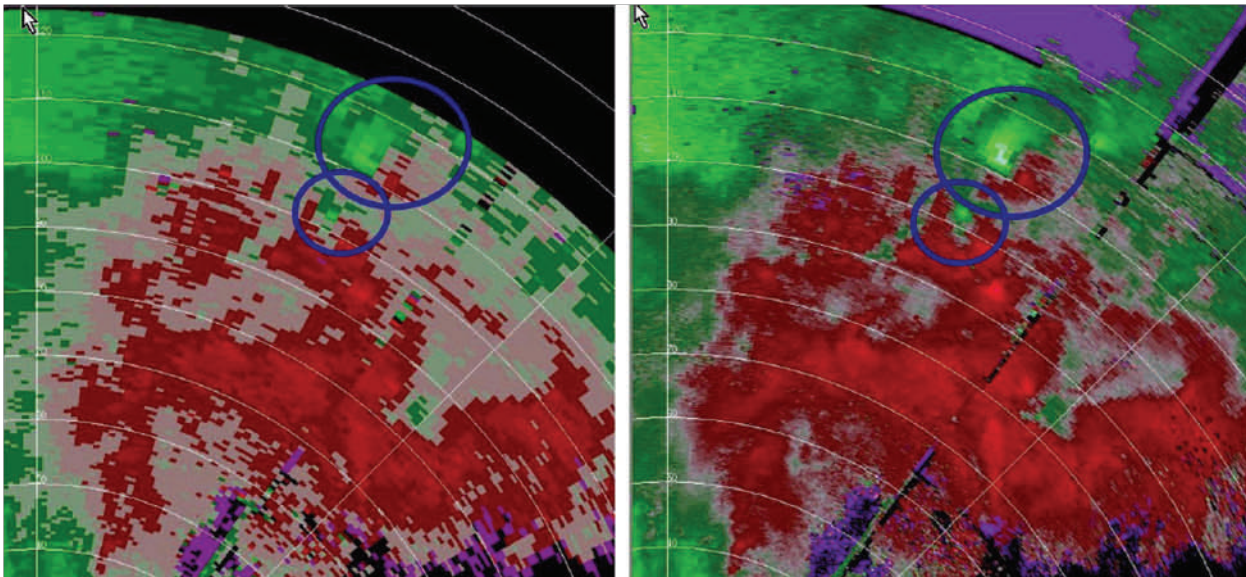
President Reagan visits a drought stricken field in Du Quoin, Illinois, July 14, 1988. Courtesy Ronald Reagan Library

Super Resolution Doppler Radar is Here!

by Edward Fenelon, Meteorologist in Charge

The National Weather Service Doppler Weather Radar located in Romeoville, IL was recently upgraded. New software delivers greatly increased forecaster ability to analyze thunderstorms for tornadic signatures, and improves tornado detection. This upgrade was installed on May 22, 2008. The upgrade, termed "Super Resolution," provides up to 8 times better spatial resolution, enabling better detection of small-scale features such as hook echoes and rotating storms. Super Resolution capability will be particularly important for smaller tornadoes, and for all tornadoes that occur at longer ranges from radars.

The Super Resolution capability increases reflectivity range resolution four-fold (250 m vs 1000 m); and increases the radar reflectivity, radial velocity and spectrum width resolution two-fold ($\frac{1}{2}$ deg vs 1 deg). In addition, the radial velocity and spectrum width data range is extended 70 km (300 km vs 230 km). This extended Doppler range enhances detection of distant severe storms.



Velocity products with 4 bit legacy resolution (left) and 8 bit super resolution (right).

There are several more functionality enhancements; i.e., improved FAA turbulence detection and Volume Coverage Patterns. First, this new software implements the FAA's NEXRAD Turbulence Detection Algorithm supporting safety of flight operations throughout our National Airspace Network. Next, Enhanced Volume Coverage Pattern (VCP) 121 is implemented. This VCP enables forecasters to recover a significant amount of wind velocity data previously lost due to Doppler range folding, thus improving tornado detection capability and advancing hurricane winds. The deployment of Super Resolution culminates the collaborative efforts initiated in the NWS Headquarters Office of Science & Technology to ensure benefits from advances in radar science and technology are transitioned to forecast operations. The Super Resolution upgrade builds upon NEXRAD Product Improvements to signal and scientific processing and through research at NOAA's National Severe Storms Laboratory, software implementation at the Systems Engineering Center, integration, testing and deployment at Radar Operations Center, and training by Warning Decision Training Center.

This upgrade is yet another in an ongoing series of enhancements implemented over the past several years to keep the WSR-88D weather radar network the most advanced and sophisticated weather radar network in operation anywhere in the world.

Summertime is Severe Weather Time: Weather Safety at Home

by Jennifer Schuller, Valparaiso University, Meteorology Student Volunteer

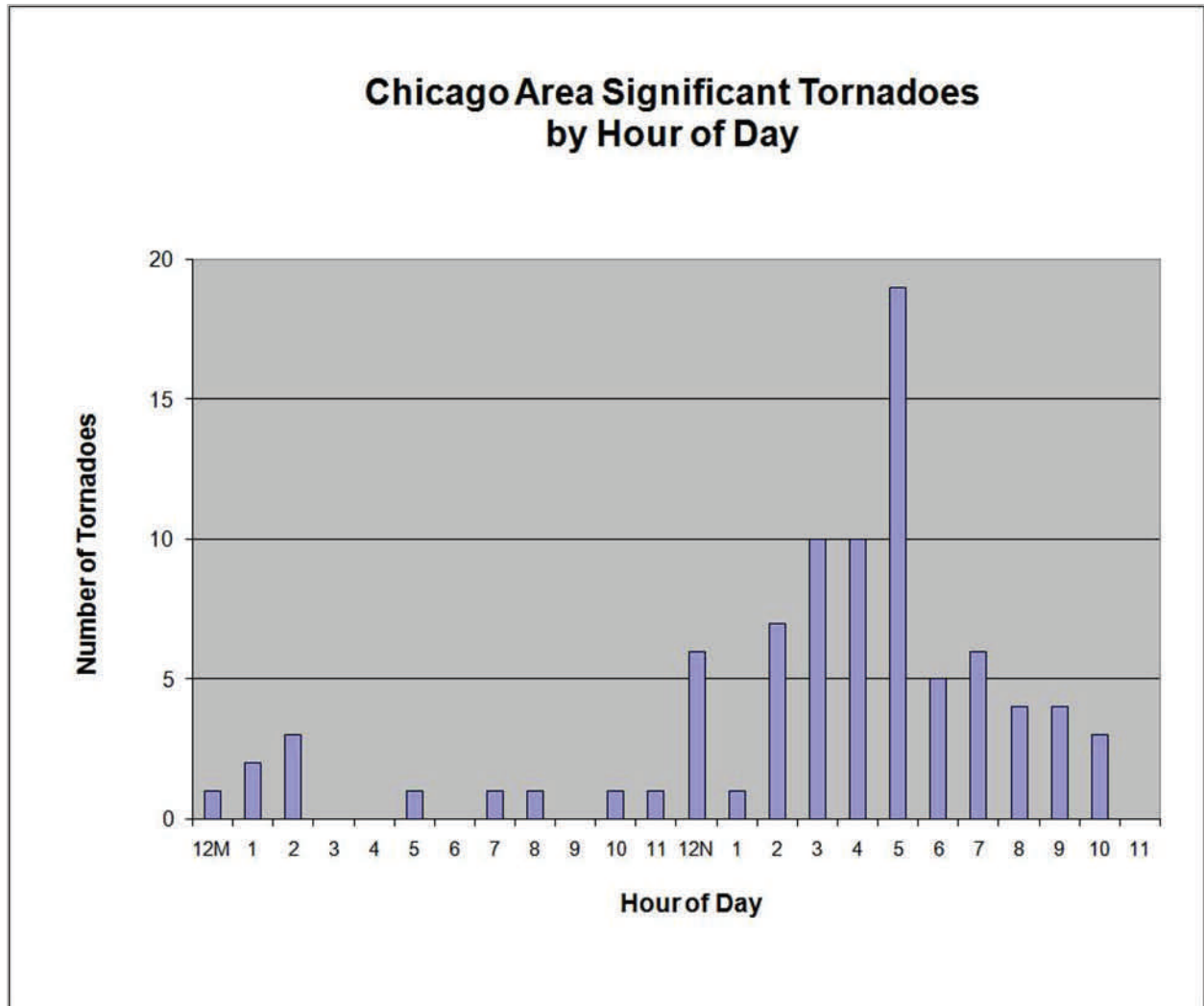
Summer is one of the most important times to discuss and practice severe weather safety. Tornado drills are practiced at school, but what about at home? Being weather-ready at home is the key to keeping your family safe.

Summer is the time when many televisions are turned off, most activities are taken outside, and severe weather can be easily overlooked. Being aware of any upcoming severe weather is your first defense. NOAA Weather Radio –All Hazards provides 24/7 information on current local weather and any Watches or Warnings issued for your area. They also let out a tone alarm whenever a watch or warning is issued for your area day or night. This provides you with immediate weather information and gives you time to seek shelter which can be lifesaving information, but it is up to you to heed the warning.

When severe weather strikes, be prepared, and have a plan ready. During a Tornado Warning know where your shelter is - either a basement or the most interior room of the building. Contrary to belief, taking shelter in the southwest corner of a room does not provide any extra protection. Do not open any doors or windows, for it does not equalize the house pressure and may cause more harm to the structure. Have a kit ready with first aid supplies, flashlight, batteries, bottled water, weather radio, and important documents all in a waterproof container. Practicing the family weather safety plan makes sure kids know what to do and what not to do, even when parents may not be home. No matter what the outcome, with these things you'll be prepared for whatever strikes.



The term Severe Thunderstorm Watch or Warning may be heard throughout the summer but what is technically a *severe thunderstorm*? It is more than the average garden shower; the storm requires at least $\frac{3}{4}$ inch diameter hail, and/or at least 58 mph winds, and/or a tornado. A Severe Thunderstorm or Tornado Watch means that the conditions are favorable for a severe storm or tornado. A Warning means that the severe weather is imminent, so take shelter immediately. Peak tornado activity is in the afternoon and evening. This is the time when sports are taking place and when summertime activities are being held. Preplanning is important. When you already have a plan in place, you're able to stay calm and act quickly when severe weather hits.



Graph of significant tornadoes (f2 or greater) in the 8-county Chicago metro area by hour of day.

When not at home to turn on a television or regular radio, a battery powered portable NOAA Weather Radio is good to have in hand. If you are out on the road and encounter a tornado, do not take shelter at an overpass and do not try to outrun a tornado; go to a low lying area or ditch to take cover instead.

No matter what the weather, it is always good to stay informed and be weather ready. For more on weather and weather safety visit:

www.weather.gov

www.noaawatch.gov/themes/severe.php

<http://www.weather.gov/om/severeweather/index.shtml>