



Summer 2007
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A Tale of Two Summers

by Jim Allsopp, Warning Coordination Meteorologist

The summer of 1955 was the hottest on record in Chicago. In contrast, the summer of 1992 was among the coolest.

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Chicago's official temperature records go back to the 1870s. Prior to 1942, the official observations were taken at various locations in downtown, near Lake Michigan, and then at the University of Chicago, also near the Lake. From 1942 through 1980 observations were taken at Midway Airport, and from 1980 to present, O'Hare Airport has been to official observation site. The airports have much less lake influence and generally register warmer temperatures in summer than a lakeside location. As a result, nine of Chicago's top ten all-time coolest summers occurred before 1942 when readings were taken close to the Lake. 1992 stands out as the coolest summer ever recorded inland from the Lake.

1955

The summer of 1955 was one of several hot summers of the 1950s. In fact, six of Chicago's eleven all-time hottest summers occurred during the period from 1949 through 1959. The average temperature for the summer months of June, July and August, 1955 was 76.4°, which was 5.3° above the normal of 71.1°.

The season started on a warm note with May averaging 5.1° above normal. June was only 0.9° above normal. July, 1955 was not only the hottest July on record but also the hottest month ever recorded in Chicago with an average temperature of 81.3°, 8 degrees warmer than normal. August, 1955 was the third hottest August on record, 7 degrees above normal. The season finished strong with September 4.1° above normal.

There were forty six days with a temperature at or above 90 in 1955, second only to the forty seven 90 degree days recorded in 1988. Nineteen of the 31 days in July were at or above 90, the most 90 degree days ever recorded in a month in Chicago.



Chicago, 1955

There was a string of 11 consecutive days at or above 90 from July 26 to August 5, also a record. Normally, O'Hare records seventeen days a year at or above 90, and Midway has twenty one days. Despite the persistent and intense heat, the thermometer only reached 100 once in 1955, on July 27.



1992

In contrast, 1992 was one of the chilliest “warm seasons” ever in Chicago. The cool weather was likely the result of the catastrophic volcanic eruptions of Mount Pinatubo in the Philippines in June of 1991. Mount Pinatubo was the second largest eruption of the 20th century, ejecting about 10 billion metric tons of magma and 15 to 30 million tons of sulfur dioxide. The ash plume reached as high as 21 miles (110 thousand feet) into the atmosphere. This is about twice as high as a large severe thunderstorm. The injection of aerosols into the stratosphere may have been the largest since Krakatoa in 1883. As a result, global temperatures cooled by as much as 0.9° F.

In Chicago, the average temperature for the summer months of June, July, and August, 1992 was only 67.1°, which was 4 degrees below normal. June was 3.3° below normal, July was the 6th coolest on record at 4 degrees below normal, and August was the third coolest on record at 4.7° below normal. May and September were also cool.

There were only six days when the temperature reached 90 degrees or more in 1992 - two in June, two in July, and two in August. In contrast, there were 13 chilly days when the high temperature failed to reach 70.



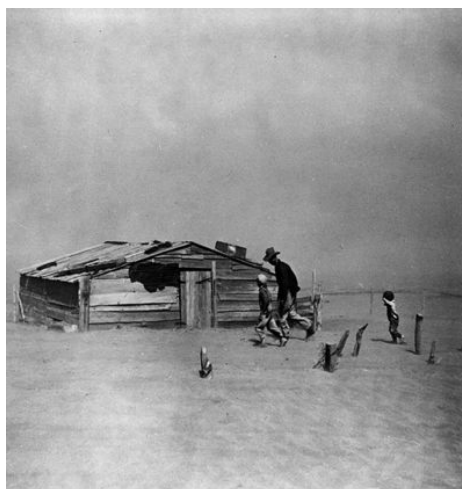
*Mount Pinatubo, Philippines – June 1991.
Photo Courtesy of USGS, taken from Clark Air Force Base*

Rockford's Torrid July of 1936

by Jim Allsopp, Warning Coordination Meteorologist

Of all the weather data recorded in the city of Rockford since 1905, nothing stands out like the string of 100 degree heat that blasted the city in July of 1936. 100 degree temperatures were not uncommon in Rockford. Between 1911 and 1935, the mercury hit the century mark more than fifty times. 1916, 1921, 1931 and 1934 were particularly hot summers. 1921 was the hottest summer on record and 1934 had eleven days of 100 degrees or more. But nothing compares to the incredible span of hot weather that occurred in July of 1936.

There were nine straight days with a high temperature of 100 or more from July 6 through July 14. In all, twelve days reached 100 in July and 3 more occurred in August. The all-time record for Rockford of 112 degrees set on July 14, 1936. The average high temperature for the month was 96.5 degrees, some 13.4 degrees above normal! All of the 100 degree days still stand as daily records today.



While drought and dust storms plagued the Great Plains during the Dust Bowl summer of 1936, Rockford was baking in 100 degree heat.

Here are the daily maximum and minimum temperatures for Rockford from July, 1936. Records are in red. Because of drought conditions (only .66 inches of rain fell in July 1936), night time low temperatures were relatively cool, with several lows dropping into the 50s. Diurnal temperature ranges of 35 to 40 degrees are not uncommon in dry weather.

Date	High	Low
1	88	50
2	89	55
3	88	58
4	89	60
5	84	64
6	102	63
7	105	67
8	104	69
9	101	70
10	106	73
11	108	73
12	109	74
13	110	73
14	112	74
15	99	71
16	100	66
17	104	66
18	95	68
19	84	65
20	87	58
21	90	50
22	95	63
23	93	65
24	85	62
25	95	63
26	103	69
27	99	68
28	99	60
29	90	56
30	87	48
31	90	50

Heat Safety

by Karen Braun, Meteorology Student Volunteer

Excessive heat is not often recognized as a “natural disaster” or a “severe weather phenomenon.” Floods are considered to be the deadliest natural disaster in the US, with a 30-year average of 120 deaths per year. However, the 20-year average for excessive heat is 190 deaths per year. People aged 65 and older account for 45% of these deaths. In the past five summers in the Chicago area, 78 deaths were attributed to excessive heat, while only 5 deaths were the result of all other weather-related events. The 1990s turned up two major heat events: July 13-15, 1995, and July 29-31, 1999. Combining these two events, the death toll exceeded 600 in the immediate Chicago area.

It is imperative to know some basic terms related to heat waves, how to stay notified about potential events, and steps to take when bracing for the heat. Being prepared could help save your life or the life of a loved one.



Know the Difference

Heat Watch: There is a good chance that excessive heat will occur in the next day or two, but there is still some uncertainty. Prepare yourself for the event, and keep yourself updated in case a warning is issued

Heat Warning: Dangerous levels of heat and humidity are occurring or highly likely within the next day. Take the necessary precautions immediately.

Advisory*: Heat and humidity are expected to remain below the warning criteria, but are still significant enough to cause inconvenience. Use caution.

** Heat advisories are not issued for Chicago/Cook County, but they are issued for smaller cities and suburban and rural areas of northern Illinois and northwest Indiana.*

Terminology

Heat Wave: at least 3 consecutive days of air temperatures 90° F (32.2° C) or greater

Heat Index (HI): A measure of how hot it feels when the relative humidity is factored into the actual air temperature. Exposure to full sunshine can increase the heat index by 15° F.

Calculate the heat index using the Meteorological calculator at <http://www.crh.noaa.gov/ilx/calculator.php>

Excessive Heat Warning:

Chicago/Cook County:

3 consecutive days with peak HI of 100-105 with either 85% sunshine, or a minimum HI of 75 or greater

2 consecutive days with peak HI 105-110 or

1 day with peak HI of 110 or greater.

Suburban and rural counties:

3 hours or more with maximum heat index 115 or greater with minimum temperature around 80 or greater.

Heat Cramps *: Muscular pains and spasms due to heavy exertion. The loss of water and salt from heavy sweating causes the cramps.

Heat Exhaustion *: Body fluids are lost through heavy sweating due to strenuous exercise in a warm, humid place. Fluid loss causes blood flow to decrease in the vital organs, resulting in a form of shock. Sweat does not evaporate as it should, and as a result, the body is not cooled properly.

Heat Stroke *: Life-threatening. The victim's temperature control system, which produces sweating to cool the body, stops working. The body temperature can rise so high, up to 105, that brain damage and death may result if the body is not cooled quickly.

* visit www.redcross.org for symptoms and treatments for these conditions

NOAA's National Weather Service Heat Index

Temperature (°F)

Relative Humidity (%)	Temperature (°F)															
	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution
 Extreme Caution
 Danger
 Extreme Danger

Preparing for a Heat Wave

- Stay tuned to NOAA Weather Radio or local radio/TV stations when there is the threat of a heat event.
- Be sure to check the forecasts before planning outdoor activities.
- Be sure your air conditioning system is properly maintained and in good working condition.
- If you don't have air conditioning, check for public cooling shelters or plan to spend part of the day at a public indoor place such as a shopping mall or a library.
- Check on the elderly and the young, who are especially susceptible to heat.

During a Heat Wave

- Drink plenty of water, even when you're not thirsty.
- Avoid alcohol and caffeinated beverages.
- Avoid salty foods that will dehydrate you.
- Dress appropriately: wear loose, light colored clothing. Wearing sunglasses protects your eyes from harmful UV rays, and a hat or umbrella will protect your face and head.
- Avoid strenuous activity. Take frequent breaks and try to plan indoor activities as much as possible.
- Always use sunscreen. Sunburns reduce the body's ability to provide cooling.
- Keep the lights off and blinds closed when possible. Avoid using appliances such as the oven during peak times of the day.
- Do not leave children or pets in a closed vehicle.

Heat Statistics for Chicago and Rockford

	Chicago	Rockford
Hottest Three Summers	1955, 1995, 1921	1921, 1934, 1983
Max Temperature	105 * (July 24, 1934)	112 (July 14, 1936)
Average/Max June Temp	79.2 / 104 (1988)	79.9 / 106 (1934)
Average/Max July Temp	83.5 / 105 * (1934)	83.1 / 112 (1936)
Average/Max Aug Temp	81.2 / 102 (1918)	80.9 / 104 (1988)
90+ days in 2006	15	10
90+ days in 2005	25 **	31

* The highest temperature ever recorded in Chicago was 109 at Midway Airport in 1934, but Midway was not the official observatory at the time.

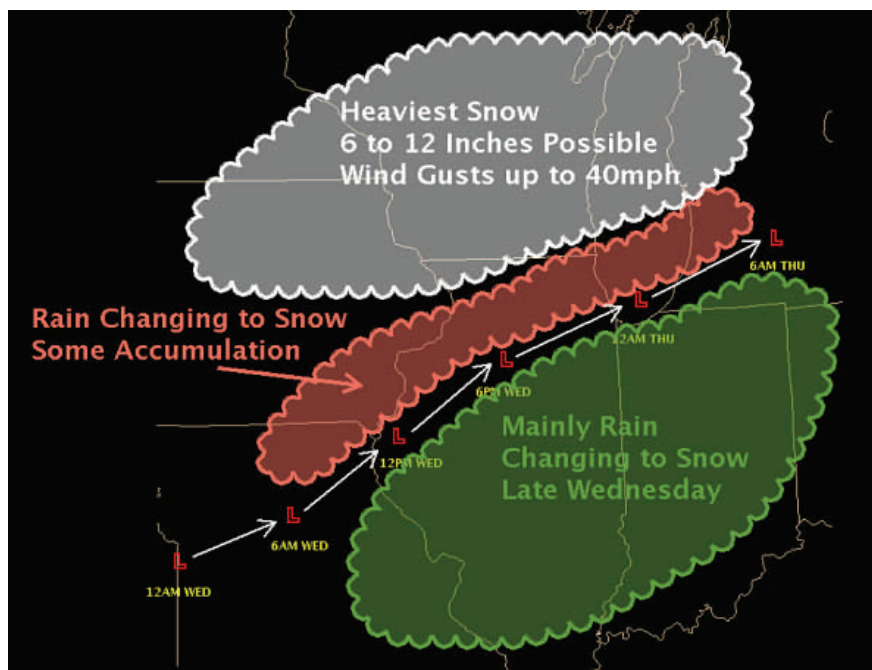
** Includes a 102 degree reading on July 24, 2005.

Graphicast - Coming Soon to WFO Chicago!!!

by Tim Halbach, Meteorologist

Starting in the early portion of the summer, the National Weather Service in Chicago will begin issuing a daily “**Weather Story of the Day**” which will be accessible via the NWS Chicago Homepage (weather.gov/chicago). The graphic is meant to visually highlight what the main weather story will be over the next 7 days and will serve as an enhancement to some of the current text products that the NWS currently creates on a daily basis.

As anyone in this area knows, we receive basically every type of weather phenomenon out there, so there likely will be an ever-changing assortment of topics created with this product. Over the course of the next year, we will add two other graphical products to the daily weather story, which include a graphical Nowcast and a graphical Hazardous Weather Outlook that will supplement both of these text products that we currently create. The Weather Story will be created on a daily basis sometime between 4am and 7am and updated (if need be) during the middle of the afternoon.



Example of Graphicast Image

Lightning Safety

By Rebecca Belobraydich, Meteorology Student Volunteer

Summer is the time of year when many people head outdoors for various sports and recreational activities. Unfortunately, it is also a time of year when lightning is a major concern, and the danger that is posed by lightning is one that should not be ignored.

Lightning is a much underrated risk. It is caused by a discharge of electricity that has enough energy to light up New York City and to heat the air around the discharge to around 50,000° F. On average, more people are killed by lightning each year than are killed by tornadoes or hurricanes, being surpassed only by flooding as the leading storm related killer. However, since lightning is so common and when it strikes it does not cause widespread damage, it is often overlooked as a major danger. In 2006 alone, there were 47 reported lightning related fatalities in the United States. Not all lightning strikes result in death, though. In the United States each year, there are about 300 reported lightning injuries and, even though not every lightning strike is fatal, many of the lightning injuries that occur cause damage to the nervous system and have lifelong, debilitating effects. It is easy to see that lightning is a danger of which people need to be aware.

There is no way to predict where lightning will strike next, so the best course of action is to seek shelter whenever thunder is heard. A common misconception is that it must be raining in order for lightning to be a threat, but that is not true as lightning can strike up to 10 miles away from the area in which the rain is falling. That is also approximately the distance from which you can hear the thunder caused by the lightning, so if you can hear thunder, you are in danger of being struck by lightning. ***“When Thunder Roars, Go Indoors!”***



The best place to be during a thunderstorm is inside a well-constructed, enclosed building with plumbing and wiring. While indoors, though, lightning can still be a danger. Since the electricity from a lightning strike can flow through electrical and telephone wires and plumbing, do not take a shower or bath, talk on a phone with a cord (a cordless phone or cell phone is okay), or use electrical equipment that is attached to the wall during a thunderstorm. If a building is unavailable in which to seek shelter, an enclosed metal vehicle with the windows rolled up is the next best place. If the car is struck, the metal frame of the vehicle will conduct the current to the ground, keeping the person inside safe as long as they do not touch any metal parts.

Lightning at Fenway Park, Boston - Photo Courtesy of Associated Press/World Wide Photos

The worst place to be during a thunderstorm is outside. Approximately a third of all lightning victims are struck while outdoors during sports or recreational activities. If caught outside while there is lightning in the vicinity and there are no safe shelters around, do not seek safety under a tree or other isolated tall objects, especially metal ones, since lightning tends to favor them. Also, avoid open areas as much as possible since you would then be the tallest object. Instead, try to reduce your chances of being struck by finding the lowest spot around and making yourself as small as you can with as little contact with the ground as possible. This can be achieved by crouching down on the balls of your feet with your head down.

The best way to keep from being caught in a dangerous situation in which lightning is a risk is to pay attention to what is happening with the weather. If you are aware of the possible risk of thunderstorms ahead of time, you can plan and prepare appropriately in order to not be caught unawares without any shelter in which to seek safety. That is the best way to avoid becoming the victim of a lightning strike.

For more information visit www.lightningsafety.noaa.gov

Red Flag Warnings

by Casey Sullivan, Meteorologist

In late May 2007, the National Weather Service issued a Red Flag Warning for northern Illinois and northwest Indiana. Red Flag warnings are issued when a combination of dry vegetation, low relative humidity and high winds create a dangerous environment for wildfires and fire behavior.

There are three criteria forecasters evaluate before issuing a red flag warning. They are relative humidity of 25% or less, surface winds 20 mph or higher and 10 hour fuel moisture at 8% or less. Fuel moisture is a measure of how much moisture exists in vegetation, which can be used to determine how fast it will burn. There are different fuel moisture indicators, including 1 hour fuels, 10 hour fuels, 100 hour fuels, etc. A 10 hour fuel would be the equivalent of a small branch roughly one half inch thick. This means that it would take approximately 10 hours for a one half inch thick branch to dry after being saturated.

When forecasters determine that these conditions will be met in the next 24 hours, they will issue a red flag warning which is used primarily by fire and land management agencies. If these conditions are expected to develop within the next 72 hours, forecasters can also issue a Fire Weather Watch, which means we may meet red flag warning criteria within the next 72 hours.

Red flag warnings are rare in this part of the country. While we often see surface winds over 20 mph, it is rare that relative humidity drops below 25%. When it does, 10 hour fuel moisture is generally low as well. The last time a red flag warning was issued was April 15, 2004.



Prairie fire – photo courtesy of Iowa Waste Reduction Center

For more information about fire weather forecasts, products and services, please visit our fire weather webpage at,

<http://www.crh.noaa.gov/lot/?n=firewx>