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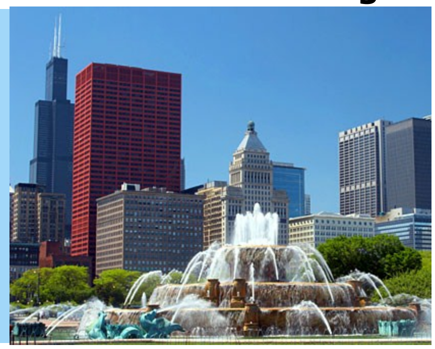
National Weather Service Forecast Office Chicago

Weather Currents



Summer 2012

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Beat the Heat, Check the Backseat!

by Jim Allsopp, Warning Coordination Meteorologist

One of the biggest weather related risks during the summer months is the possibility of a child dying in a vehicle from heat stroke. The temperature inside a vehicle can rise 20 degrees in as little as 10 minutes, and 50 degrees in an hour - even when outside air temperatures are in the 70's! The inside of a car acts like a greenhouse, where actual temperatures inside the vehicle can reach 120°F in minutes and approach 150°F in as little as an hour! This can cause hyperthermia (heat stroke) in only minutes, particularly in a child, whose body temperature warms at a rate three to five times faster than an adult. Studies have shown that "cracking the windows" provides little (if any) relief.

Since 1998, 13 children have died in Illinois and 7 in Indiana from heat stroke suffered while in a vehicle (530 children have died nationwide). Nationally, half of these were children that were forgotten by a parent or other caregiver, and nearly 20 percent died when parents knowingly left their child in a vehicle. The rest died playing in an unattended vehicle.

All of these tragic deaths are preventable. To help bring awareness to this issue, the National Weather Service is using the slogan "Beat the Heat, Check the Backseat" to remind people to check for small children in a car seat and to never leave children unattended in a vehicle - even for a few moments. Remember that pets should also never be left in a vehicle during the summer months.

The following are basic safety recommendations:

- Never leave a child unattended in a vehicle. Not even for a minute!
- If you see a child unattended in a hot vehicle, call 9-1-1 immediately!
- If a child is missing, always check the pool first, and then the car, including the trunk.
- Be sure that all occupants leave the vehicle when unloading. Don't overlook sleeping babies.

- Always lock your car and ensure children do not have access to keys or remote entry devices.
- Teach your children that vehicles are never to be used as a play area.
- Keep a stuffed animal in the car seat. When the child is put in the seat, place the animal in the front with the driver.
- Or, place your purse or briefcase in the back seat as a reminder that you have your child in the car.
- Make "look before you leave" a routine whenever you get out of the car.
- Ensure your child care provider will call you if your child does not show up for school.

More info at http://ggweather.com/heat/index.htm

A Warm, Dry Spring and the Summer Outlook

By Kevin Birk, Meteorologist and Ricky Castro, Meteorological Intern

The spring season (March through May) of 2012 will definitely be remembered for its unprecedented warmth across the region. Figure 1 below, courtesy of the Midwestern Regional Climate Center, displays the average spring season temperature across Illinois and also the departures from average. Spring season temperatures were an astonishing 7 to 8 degrees above average area-wide, which was record breaking. The magnitude of this warmth was due in large part to the incredibly warm conditions experienced during March.

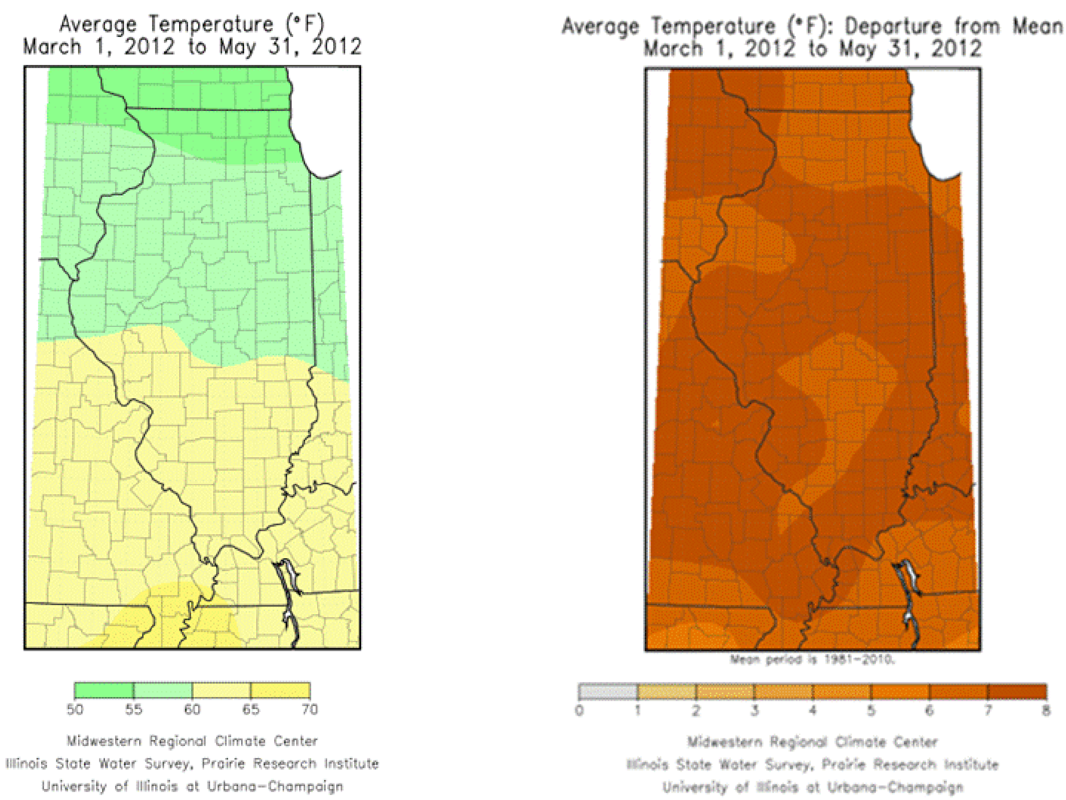


Figure 1 Average Spring Season (March-May) temp. (left), and the departure from average (right). Courtesy of the Midwest Climate Center

Dry to very dry conditions also accompanied this record breaking warmth this past spring. This was the most pronounced across central Illinois and northwestern Indiana throughout the season. Figure 2 below indicates that areas roughly along and south of interstate 80 were quite dry during the season. These areas experienced only 50 to 75 percent of the typical spring season rainfall. What makes these dry conditions even more impressive is the fact that a single heavy rainfall event on the 6th and the early morning hours on the 7th of May accounted for nearly half of the total spring season rainfall across portions of east central Illinois and portions of northwestern Indiana. During this heavy rainfall event, up to 4.43 inches of rainfall fell in Marseilles in La Salle county Illinois. However, there were widespread areas of 2 to 4 inches reported along and south of interstate 80 during this event (Figure 3). Had this heavy rain event not have occurred, areas south of interstate 80 would have only experienced 30 to 50 percent of their typical spring season precipitation.

These very dry conditions have also continued into June as well. In fact, most areas across northern Illinois and northwestern Indiana have only experienced between 18 and 50 percent of their typical rainfall for the first three weeks of June. The only exception to this is across eastern Kankakee County, where an extremely heavy, but isolated, rainfall event produced up to 7 inches of rainfall on June 16-17th.

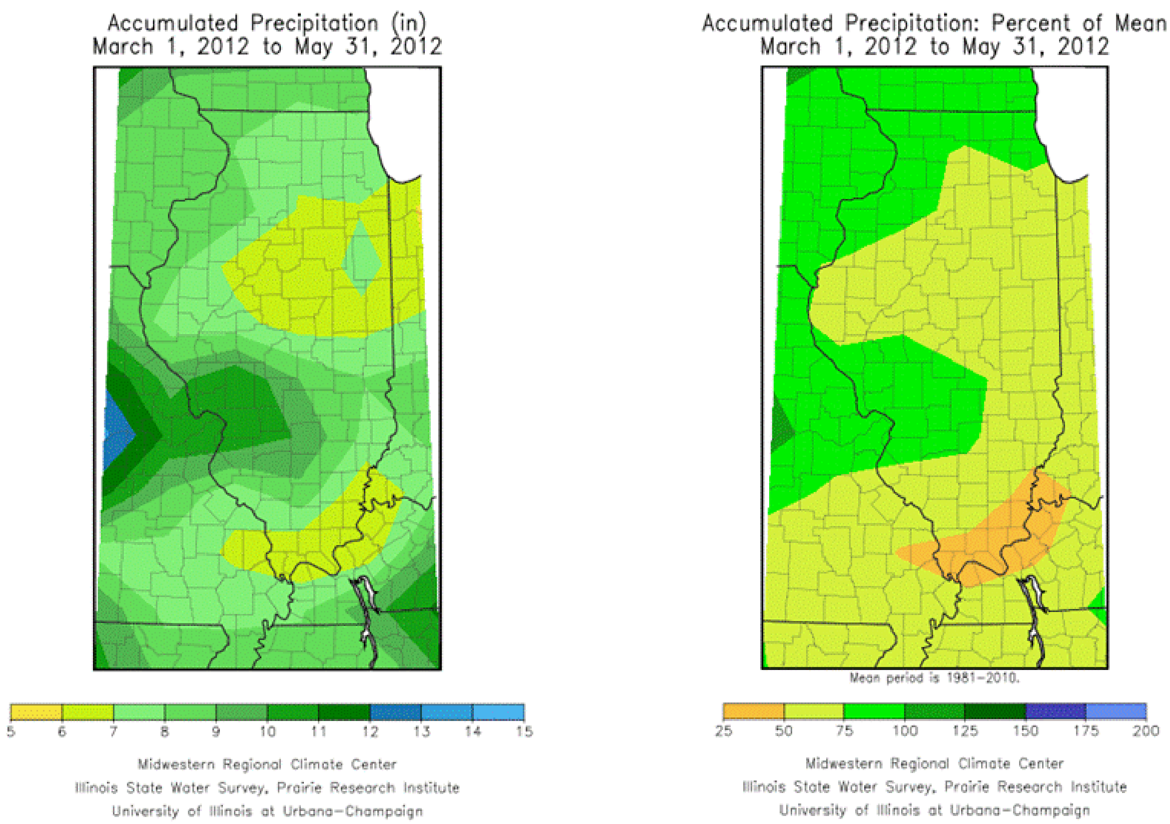


Figure 2 Total amount of Spring Season (March-May) precipitation (left), and the percentage of normal (right). Courtesy of the Midwest Climate Center

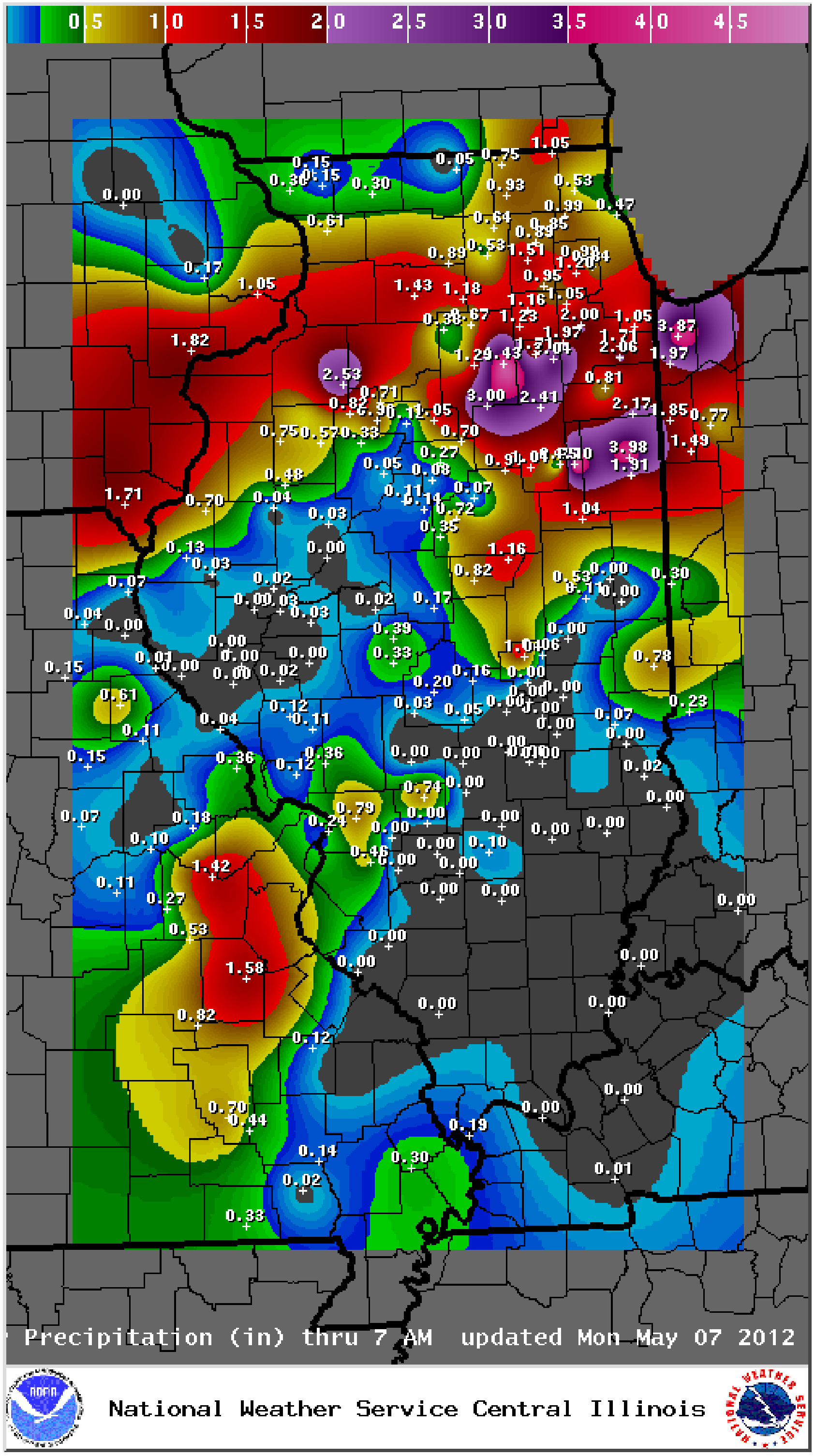


Figure 3 Total rainfall from the May 6-7 heavy rainfall event.

So why was it incredibly warm and dry this past spring? To answer this question consider figure 4 below. This figure displays the pressure anomalies in the middle portions of the atmosphere (about 18,000 FT AGL) across North America and the Pacific region. Notice the alternating pattern of the below average atmospheric pressure (cool colors) and the above average atmospheric pressure (warm colors). The importance of these pressure anomalies lies in the affects they have on the strength and geographical placement of upper level jet stream. Based on the behavior of the pressure anomalies this past spring across North America, with strong positive pressure anomalies dominating much of the central and eastern United States, and strong negative anomalies dominating western Canada and Alaska, it can be inferred that there was a strong anomalous response to the geographical placement of the upper level jet stream. Overall, the large scale pattern helped drive the spring season jet stream across the northwestern United States northeastward across southern Canada. Because the jet was displaced so far north of the area, there was little large scale support for storm systems across the central United States, resulting in well below average precipitation. The record breaking warmth also resulted from this pattern. The above average atmospheric pressure, centered across the Great Lakes region, induced persistent southerly flow in the low level s of the atmosphere across the region, resulting in an anomalous northward transport of a much warmer air mass from the southern states.

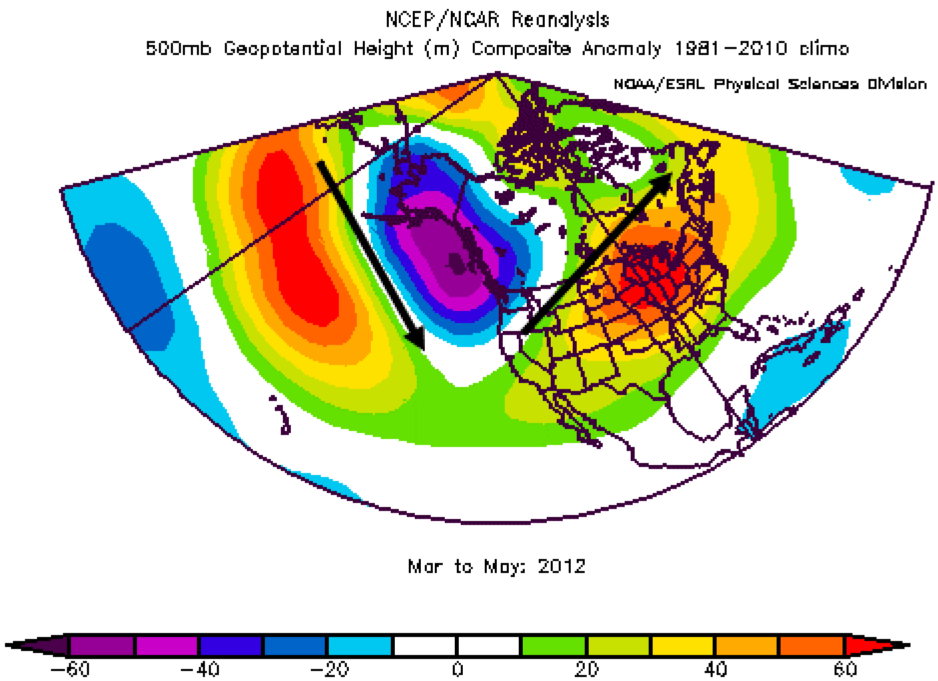


Figure 4 Upper level Pressure Anomalies from the spring season of 2012. Warm colors show areas of above average pressure and cool colors show below average pressures.

What is typical during the summer season?

Considering things have been so warm and dry across the region the past several months, one may ask what is typical during the summer season in northern Illinois? Tables 1 and 2 below display the distributions of observed daily maximum and minimum temperatures for each summer month at Chicago and Rockford. To better understand what is "more typical", consider the yellow highlighted values in the table. Temperature values between these correspond to the middle 60% of distribution, whereas anything outside of these values represents the warm and cold extremes. So, for example, daily high temperatures in June fell between 72 and 88 degrees 60 percent of the time during the 1981-2010 period at Chicago. The average High temperature is right around 80, but due to day to day variability typical high temperatures can be said to range between 72 and 88 degrees on any given day in June. However, temperatures above 88 degrees are considered to be abnormally warm and high temperatures cooler than 72 are considered to be abnormally cool.

Table 1. Chicago, *IL 1981-2010*

Probability of Exceedance	*High Temperature*			*Low Temperature*		
	June	July	August	June	July	August
90%	67	75	73	48	55	54
80%	72	78	76	51	58	57
70%	76	81	78	54	60	59
60%	78	82	80	56	62	61
50%	81	84	82	58	64	63
40%	83	86	84	60	65	65
30%	85	88	85	63	67	67
20%	88	90	87	66	69	68
10%	92	93	90	69	72	71
Average	79.7	84.1	81.9	58.0	63.8	62.7
Standard Deviation	8.9	6.9	6.7	7.7	6.3	6.4

Table 2. Rockford, *IL 1981-2010*

Probability of Exceedance	*High Temperature*			*Low Temperature*		
	June	July	August	June	July	August
90%	70	76	73	49	55	52
80%	74	79	77	52	57	55
70%	77	81	79	54	59	58
60%	79	82	80	57	61	59
50%	82	84	82	59	63	61
40%	83	85	83	60	64	63
30%	86	87	85	63	66	65
20%	88	89	87	66	68	67
10%	91	92	90	68	70	69
Average	80.5	83.8	81.8	58.2	62.7	61.0
Standard Deviation	7.9	6.2	6.6	7.1	5.9	6.4

As for summer precipitation, tables 3 and 4 below display the distributions of monthly precipitation for each summer month at Chicago and Rockford. Similar to temperatures, one can get an idea of “typical” rainfall amounts for each summer month. The tables do show that monthly precipitation amounts during the summer are quite variable. In fact, the middle 60% ranges from a low of 1.5 to around 2 inches up to over 5 inches.

Table 3. Chicago, *IL 1981-2010*			
Probability of Exceedance	*Precipitation*		
	June	*July*	August
90%	1.07"	1.68"	1.59"
80%	1.52"	2.22"	2.22"
70%	1.99"	2.72"	2.79"
60%	2.52"	3.16"	3.34"
50%	3.13"	3.52"	3.88"
40%	*3.77"*	*3.85"*	*4.59"*
30%	4.41"	4.25"	5.76"
20%	5.39"	5.02"	7.88"
10%	7.24"	6.56"	11.67"
Average	3.45"	3.70"	4.90"

Table 4. Rockford, *IL 1981-2010*			
Probability of Exceedance	*Precipitation*		
	June	*July*	August
90%	1.22"	1.20"	1.13"
80%	2.22"	1.85"	1.93"
70%	3.01"	2.43"	2.51"
60%	3.64"	2.91"	3.01"
50%	4.25"	3.36"	3.59"
40%	*4.93"*	*3.87"*	*4.38"*
30%	5.78"	4.66"	5.54"
20%	7.00"	5.94"	7.31"
10%	9.01"	7.71"	10.13"
Average	4.65"	3.95"	4.59"

What is in store this summer?

Given that we experienced a record warm and fairly dry spring following a warm and dry winter, the main question that arises now is what does the summer hold in terms of temperatures and rainfall? Overall this is a very difficult question to answer as a warm and dry winter and spring does not necessarily correlate directly to whether or not we will have a hot and dry summer. However, taking a look at the top 10 warmest spring seasons on record in Chicago and Rockford dating back to the late 1800s for Chicago and 1906 for Rockford, 8 out of 10 of them went on to produce warmer than average summer seasons (Table 5 and 6 below). The signal for precipitation is much more mixed, with a nearly 50/50 split between wetter and drier than normal during the summer.

Table 5. Top Ten Warmest Spring Seasons and the following Summer season Conditions at Chicago

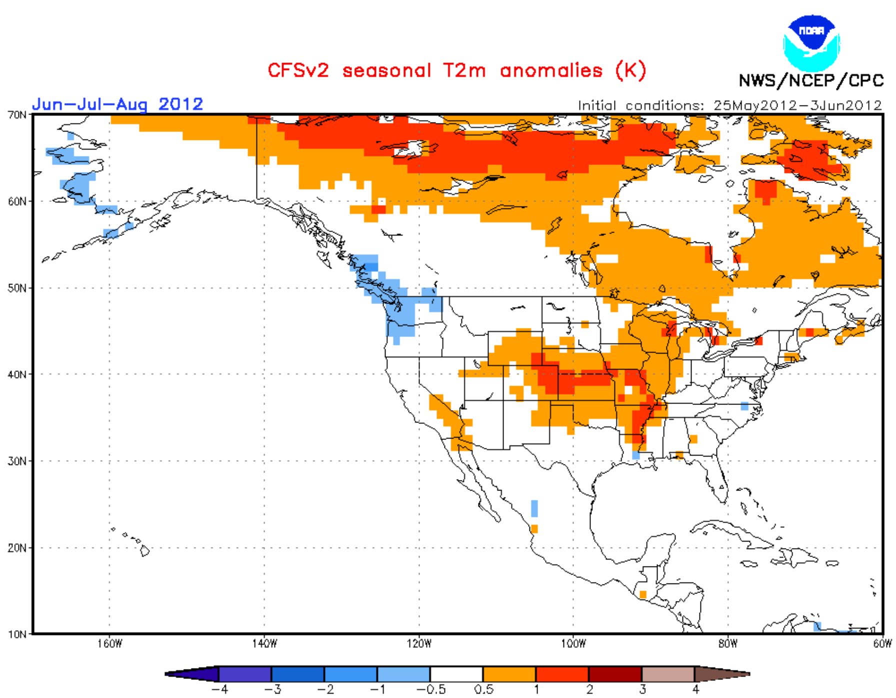
Year	Summer Temperatures	Summer Precipitation
1977	73.3	16.22
1921	75.9	8.36
1991	73.7	5.08
2010	75.2	16.81
1955	76.4	11.23
1946	70.9	9.64
1987	73.6	23.48
1968	73.7	9.01
1938	72.1	12.80
2000	70.2	10.16

Table 6. Top Ten Warmest Spring Seasons and the following Summer season Conditions at Rockford

Year	Summer Temperatures	Summer Precipitation
1977	70.5	14.7
1921	76.1	8.3
2010	73.5	17.5
1947	73.1	9.8
1991	73.7	5.8
1985	68.8	11.0
1938	72.4	16.8
1942	71.9	16.3
2007	72.8	20.5
1987	73.2	21.7

La Nina conditions, which were prevalent through the fall of 2011 and winter 2012, have been decaying across the Tropical Pacific over the past couple of months, and now conditions across the tropical Pacific resemble ENSO neutral conditions. Most of the statistical and dynamical models indicate the possibility of El Nino conditions developing by late summer and into the fall season. However, due to the high uncertainties on the overall evolution over the next several months, there are equal chances of either ENSO neutral or El Nino conditions into the fall season.

Overall, forecasting whether or not the warm and dry conditions will continue across the region this summer is extremely difficult. In fact, uncertainty is so high across the region that the Climate Prediction Center (CPC) is forecasting equal chances for above, near and below average temperatures and precipitation for the June through August period. However in spite of this, some of the dynamical models are suggesting that a warm and dry summer may occur across the region. Figures 5 and 6 below display the output from the Climate Forecast System (CFS) model. This model is a fully coupled model representing the interaction between the Earth's oceans, land and atmosphere. The model is forecasting above average temperatures and below average precipitation across the central portion of the county. This appears to be due in large part to the model wanting to develop a large and fairly persistent upper level ridge of high pressure across the central part of the county. This is a similar weather pattern to what occurred last summer, which led to a prolonged period of heat across the area in July. Unfortunately, the extent and duration of the warmth that may occur across the region is uncertain. So, although this model is hinting at a pattern that may produce some very warm conditions across the region this summer, it does not mean that it will be very warm every day. Nevertheless, given that a dry pattern continuing in the summer is typically conducive to warmer temperatures since there is less cooling influence from evaporation of soil moisture, we do think the odds are higher for the summer as a whole to average above normal. One interesting caveat is that if the extremely dry pattern continues, even if we do get into prolonged stretches of abnormally warm day time temperatures, the nights will be kept cooler by the dry soils allowing for better radiational cooling. Thus, the average temperatures may not be quite as warm because of a large diurnal difference between high temperatures and fairly comfortable overnight lows.



CFSv2 Summer season (June-August) forecasted surface temperature anomalies in degrees Celsius.

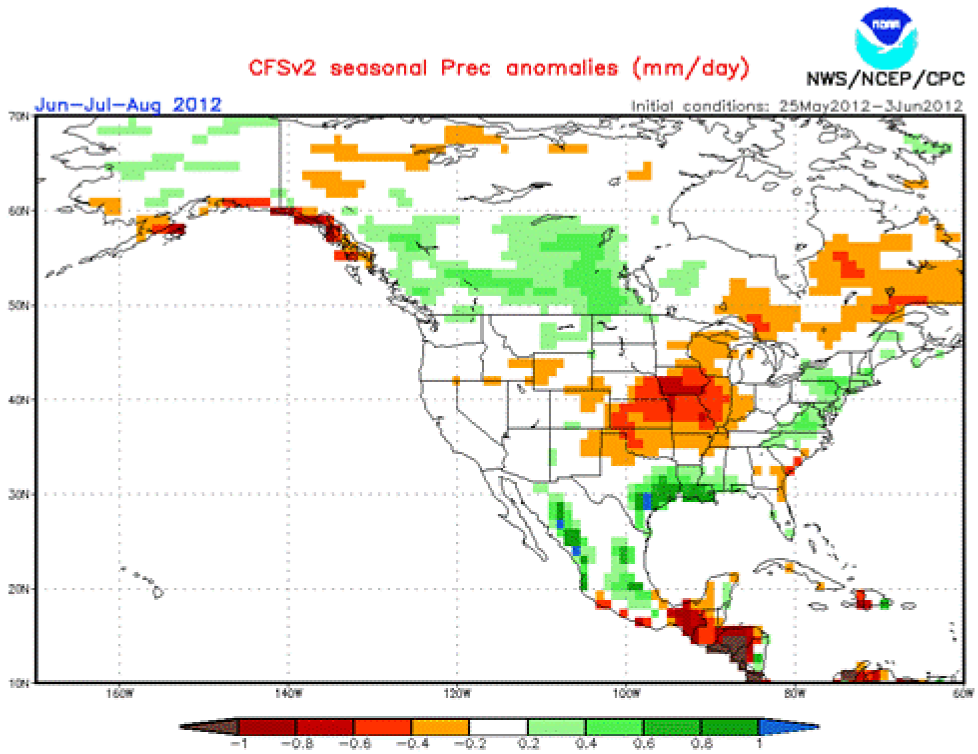


Figure 6 CFSv2 Summer season (June-August) forecasted precipitation anomalies in mm/day.

The threat of below average rainfall this summer following an already dry spring could result in worsening drought conditions across the area. However in spite of this possibility, it is noteworthy that precipitation during the summer season is largely a result of atmospheric convection (e.g., thunderstorms). Because of this, large amounts of rainfall can occur from a single event and this rainfall can also be quite localized, leading to areas of very dry conditions directly adjacent to areas of more plentiful rainfall. This is similar to the heavy rainfall event on June 16-17th that dropped up to 7 inches across parts of eastern Kankakee County. This isolated behavior adds more complexity to forecasting areas that will experience above and below average precipitation.

Figure 7 displays the current U.S. Drought Monitor as of June 19. Notice the large area of moderate to severe drought (darker brown and red colors) ongoing across the southern states from portions of Kansas southward across much of Texas eastward through the southeastern states. The warm and very dry conditions over the past few weeks has led to the expansion of moderate to severe drought into Missouri and central and southern Illinois. If dry conditions continue, this drought area will likely continue to worsen and overspread northern Illinois and northwestern Indiana.

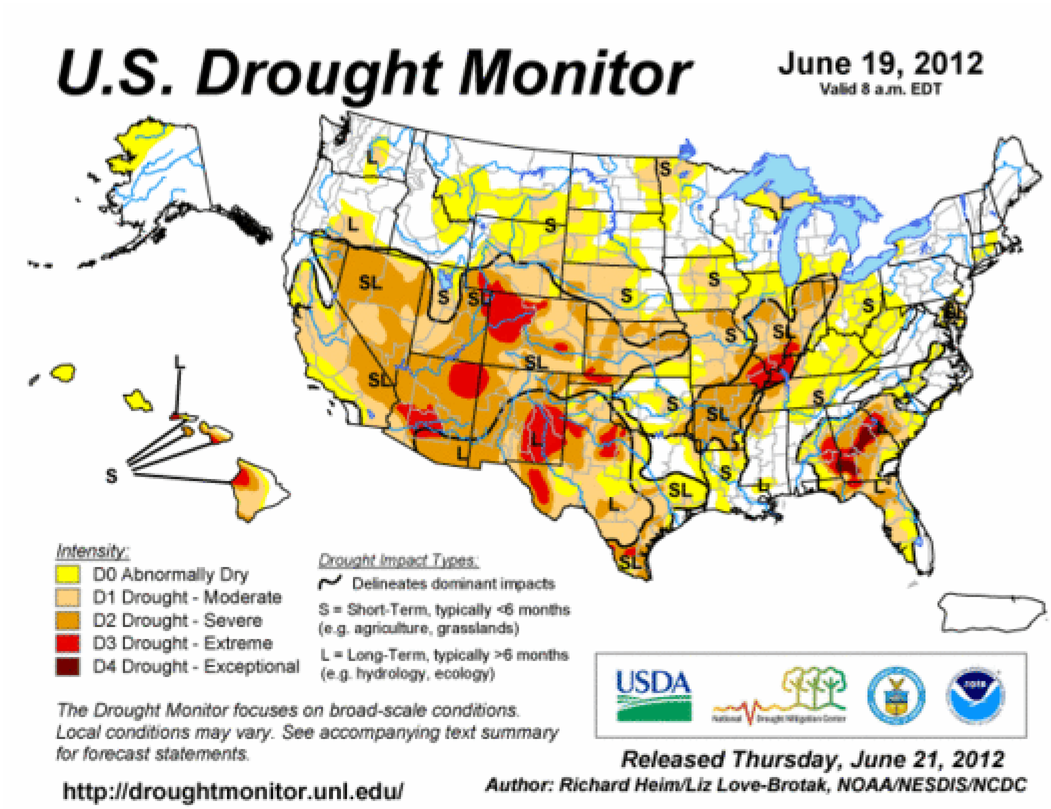


Figure 7 Current U.S. Drought Monitor as of June 19th.

Newest Changes to Weather Forecasting Models

By Max Tsaparis, Student Volunteer

Forecasting has become more accurate since the implementation of computer models. Computer models are simplified representations of the real atmosphere. They incorporate physics concepts and mathematical calculations from different sources to predict what will occur at the surface and at other levels of Earth's atmosphere. Some of these inputs include current weather observations, various vegetation types, and satellite imagery. These are all laid out on grids of various sizes and resolutions ranging from certain regions of the United States to the entire planet. Models are continually updated as computer resources increase and our knowledge of the atmosphere becomes greater.

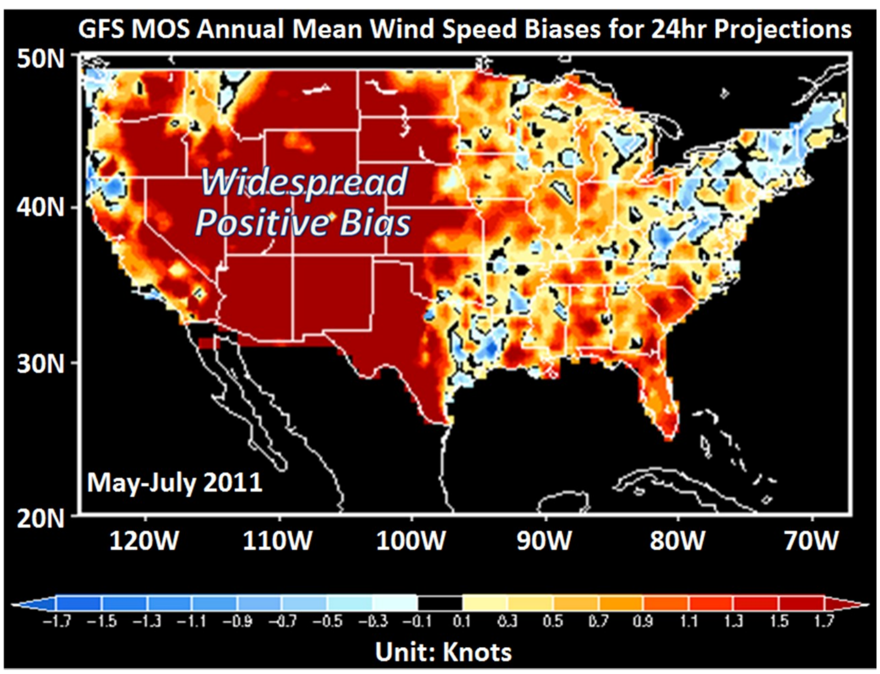
Global Forecast System (GFS) Model Upgrade – 9.0.1

A Brief History

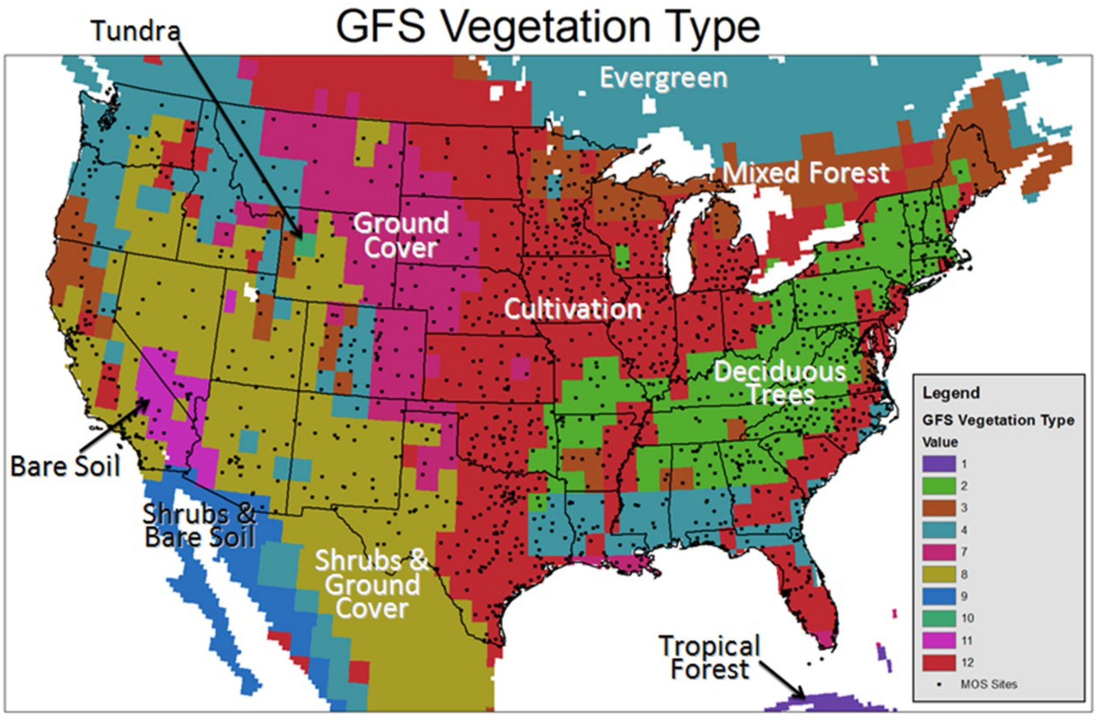
The Global Forecast System (GFS) Model, operated since 2000 by the Environmental Modeling Center, was originally comprised of the Aviation Model (AVN) and the Medium Range Forecast (MRF) Model. The AVN Model was later extended to provide longer-range guidance, which eliminated any need for the MRF Model. In 2002, the AVN Model was renamed the GFS Model.

Current Upgrade

The latest GFS upgrade was motivated in part by concerns regarding a warm bias of the surface temperature and an associated high bias in the surface wind forecast (either of which would affect the other). **Fig. 1**, which shows the wind speed bias during the warm-season period from May 2011 – July 2011, demonstrates that the Western United States was most affected by this issue.

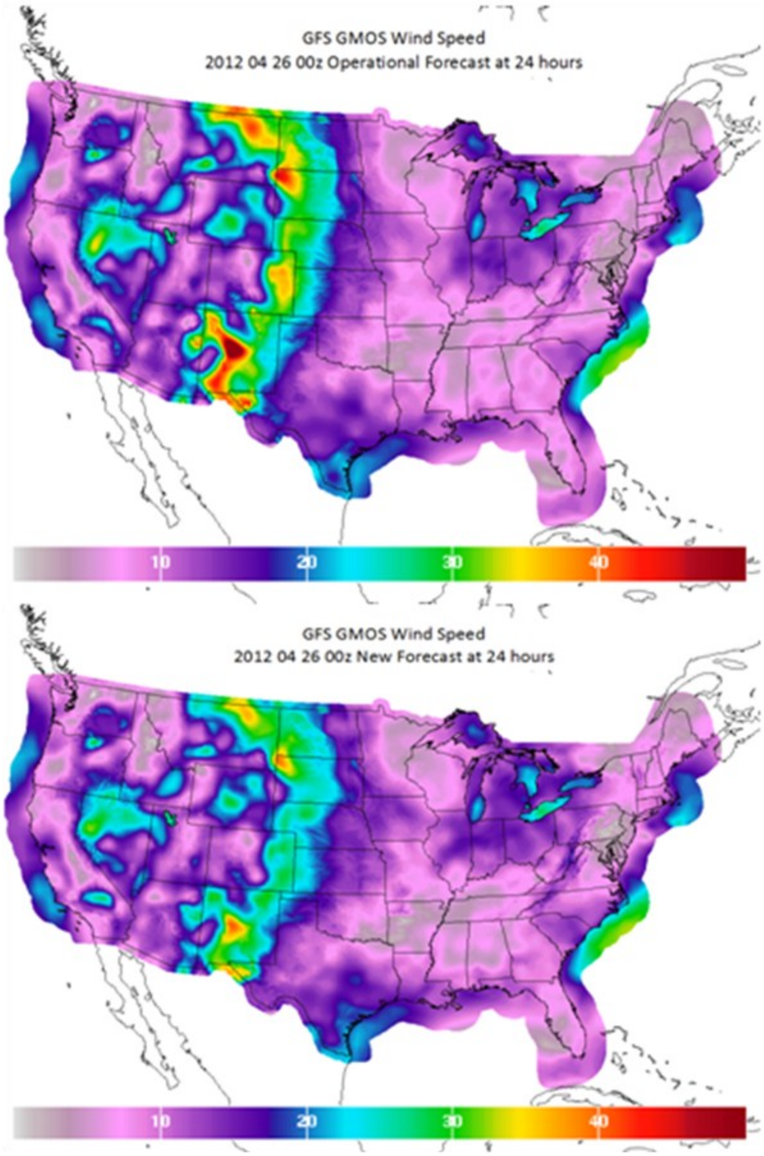


From the Central Plains to the West Coast, the 24 hour forecast winds were consistently about 1.7kts (2mph) higher than the observed wind speed. Since wind speeds were generally higher, the temperature of the near-surface air also became higher. Because the Western United States has shorter vegetation than the Eastern United States, modelers thought that changes in the vegetation component might be able to moderate surface air temperatures and wind speeds. **Fig. 2** shows how the GFS Model analyzes ten different forms of vegetation.



The Eastern side of the United States has larger forms of growth, such as Deciduous and Evergreen Trees, while the Western United States is more barren consisting of mostly ground cover, shrubs, and bare soil.

To help mitigate the warm bias in the surface air temperature, the modelers decided to add a thermal roughness length to each of these ten forms of vegetation in the United States. The thermal roughness length analyzes how the vegetation exchanges heat with the air nearest to the surface and affects the temperature. Therefore, the larger the thermal roughness, the more heat the vegetation provides to the lower atmosphere. By keeping the value of the thermal roughness length small, the heat exchange from the ground to the air decreases. With less heat being transferred from the ground, the near-surface air does not get as warm.



After reanalyzing the past two warm seasons, modelers found that the GFS Model did a better job moderating temperatures and wind speeds in the Western United States with the implementation of the thermal roughness length. **Fig. 3** shows an example of the moderation that has occurred.

During the reanalysis, pockets of anomalously high winds are subdued, and verified with actual guidance. Even in other locations around the world, model guidance will be improved now that we have a more accurate analysis of the Western United States. The GFS 9.0.1 Model became operational on June 12, 2012.

The next upgrade will occur in 2013. This will mainly change the resolution from approximately 28km to 14km of grid spacing allowing for more accurate analysis of smaller scale weather events.

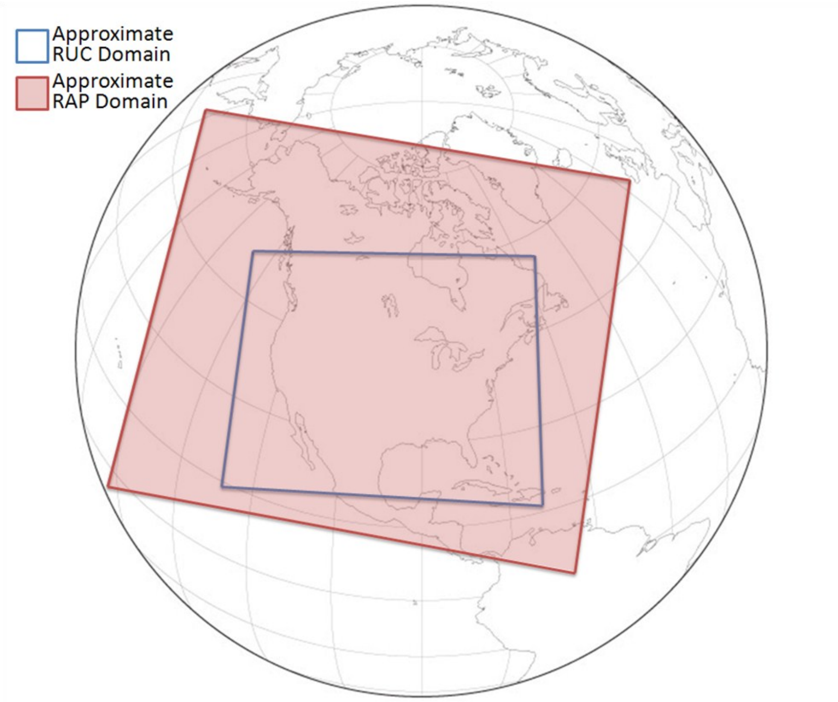
Rapid Update Cycle (RUC) to the Rapid Refresh (RAP) Analysis and Forecast System

A Brief History

The National Centers for Environmental Prediction began operational use of the Rapid Update Cycle (RUC) in 1994, which ran every three hours on a 60km grid. Since then, it was updated numerous times and until it was decommissioned earlier this summer, it ran hourly with a resolution of 13km.

Transition to RAP

As of May 1, 2012, the RUC has been replaced by the Rapid Refresh (RAP) Analysis and Forecast System. One significant change is the larger area that the RAP covers. **Fig. 4** shows the approximate domain of the RUC compared to the domain of the RAP.



It is clear that the RAP covers everything the RUC contained including the rest of North America along with the extreme northern portions of South America and the Arctic Circle. Because weather does not solely occur within these boundaries, non-global models, like the RAP, connect to larger models to get a better picture of what is going on outside of their grids. The RUC connected to the North American Model (NAM) but now that the RAP covers more area, the NAM does not suffice in being the lateral boundaries. Therefore, the outer-boundaries will be provided by the GFS. The RAP can also analyze higher into the atmosphere to give meteorologists a better idea of what is occurring at more levels.

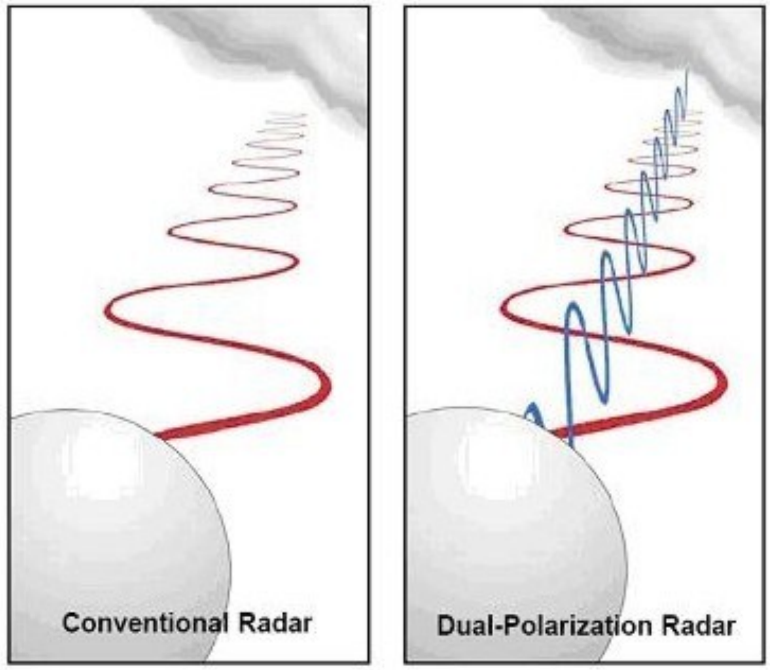
It also interprets more observations from different sources so it has a better idea what the current weather picture looks like and therefore can better predict the future. It obtains temperature and moisture observations from various airlines during their flights. It also is able to calculate the temperature and moisture levels of the atmosphere from satellite imagery.

Stay tuned to future Weather Currents Newsletters for the latest updates on computer models.

Phased Array Radar: The Next Big Thing?

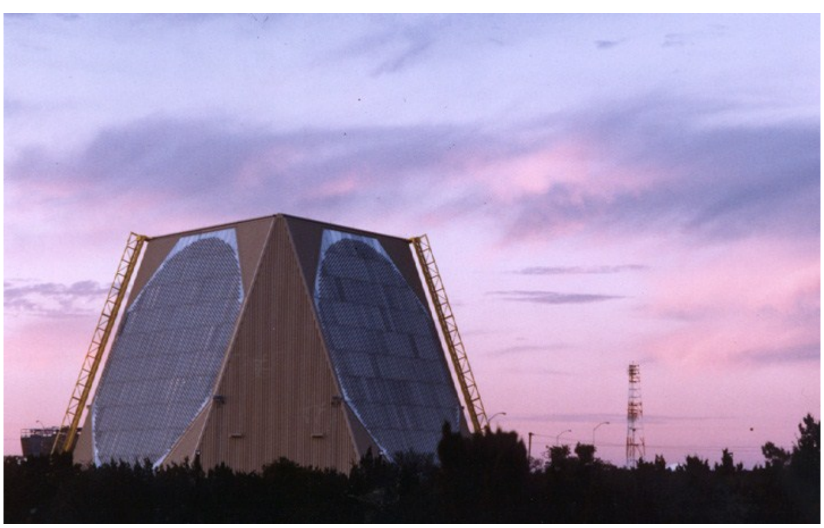
by Suzi Voss, Student Volunteer

In 2011, the Chicago NWS office implemented dual-polarization radar, a major upgrade to WSR-88D. Instead of transmitting and receiving radio waves with only a single, horizontal polarization, dual-polarization transmits and receives both horizontal and vertical polarizations. This new technology allows forecasters to more easily determine the size and shape of cloud and precipitation particles, using a correlation coefficient and ZDR (differential reflectivity) to identify hail, rain, snow, melting snow, and even airborne debris from storms.



What's next in meteorological radar technology? You might be surprised to learn that the next big advancement stems from technology originally developed over 100 years ago! In 1905, German physicist Karl Ferdinand Braun discovered a way to enhance transmission of radio waves in one direction, varying relative phases and steering the radiated beam rapidly towards a desired target. Phased Array Radar (PAR) was first used operationally to aid in landing airplanes during World War II, and it is still in use on Navy ships today to assess missile threats.

PAR features a fixed, flat antenna composed of thousands of transceiver elements, which all send and receive pulses at the same time. It has no moving parts and can scan the entire atmosphere in less than one minute, a very impressive improvement over the four to five minutes it currently takes with dual-polarization radar. Because of this rapid scanning ability, images appear on the computer screen in a format similar to a movie, instead of as a series of choppy images. Additionally, electronic beams can be independently and repeatedly directed to specific elements of a storm, giving forecasters much more comprehensive and accurate real-time data in a developing storm situation.



Phased Array Radar at El Dorado Air Force Base in El Dorado, Texas (no longer functional). Photo courtesy of Brookings.edu

Perhaps the most exciting aspect, however, is the possibility of doubling tornado warning lead times. PAR has the ability to identify storm data that is not available with current technology, such as rapid changes in wind fields, which may allow forecasters to identify storm evolution much sooner. Using equipment donated by the Navy, the National Severe Storms Laboratory (NSSL) has been testing PAR in forecasting applications since 2003 at their facility in Norman, Oklahoma, known as the National Weather Radar Testbed (NWRT). Scientists at this facility are focused on developing faster and more accurate warning, analysis and forecast techniques for severe weather with experimental radar technology. Using data from prior tornado events, forecasters looking at the one-minute storm updates from PAR were able to issue a warning 21 minutes before tornado touchdown, which was 13 minutes sooner than those who got the standard 5 minute updates using dual-polarization WSR-88D. NSSL researchers speculate that using PAR could possibly increase tornado warning lead time to 45 minutes or more. If you'd like to see a real-time comparison of WSR-88D and PAR, you may do so here: KTLX vs. NWRT Images

While PAR clearly holds substantial promise, it cannot realistically be implemented operationally for at least another 10-15 years. The biggest obstacle, of course, is the cost of upgrading radar equipment at every forecast office. According to the NSSL, each of the 4000 elements in the phased-array antenna donated by the Navy in 2003 would have originally cost about $2000. Cheaper components resulting from recent advances in cellular technology have bought the price of each element down to around $100, but the price would need to fall below $50 to make the radar affordable for weather monitoring. Cost savings could potentially come from combining weather radars with the Federal Aviation Administration's air traffic radars to make one system. Such a system could save the federal government close to $5 billion, according to the NSSL, but is unlikely to happen. In the meantime, research continues at the NWRT to fine-tune forecasting applications of PAR so that it is ready for action when forecast offices receive this incredible technology sometime in the future.

NWRT (National Weather Radar Testbed) Phased Array Radar

Seiches and Rip Currents on Lake Michigan

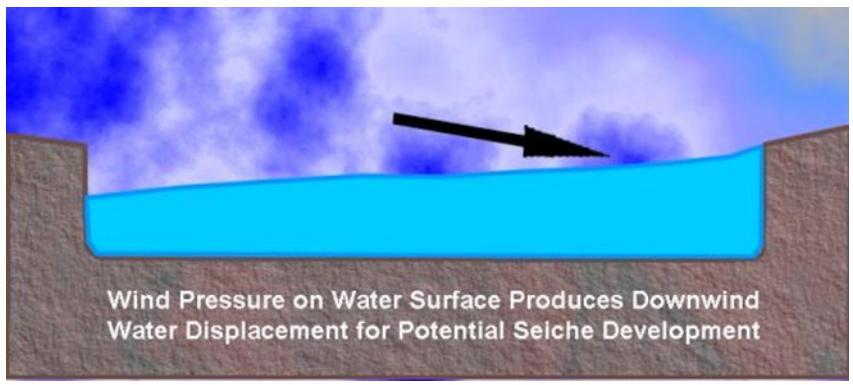
by Samantha Borth, Student Volunteer

With beach season rapidly approaching, there are a few safety precautions to keep in mind before you or your family head out for some fun in the sun. The presence of seiches and rip currents can easily ruin a beachgoers day, so it's always important to be aware of these potential risks.

Seiches

A seiche is a standing wave that oscillates in an enclosed body of water as a result of an atmospheric disturbance creating a large fluctuation of water levels. The French word "seiche" refers to a "swaying back and forth." Seiches are known for piling water up against a shore. Although rare, this phenomenon can happen in the Great Lakes, especially when a strong storm system passes through the area. The most common weather systems associated with seiches are squall lines.

A seiche forms when a disturbance in the water level occurs. The passage of a storm system is the perfect example. As a low-pressure system passes, the higher pressure air around the system "pushes" the water down and "drives" the water towards the area of lower pressure. Gravity responds by attempting to restore the water's equilibrium, thus beginning the oscillation. Squall lines provide the perfect opportunities for seiches to form, because the strong winds and the pressure spikes associated with their outflow essentially help create this oscillation.



The image above depicts how wind and pressure spikes can create a fluctuation in water levels.

The abrupt change in the water level is the danger with seiches. Once a storm system has passed, beachgoers believe that it is ok to head back towards the water, fully unaware of an approaching seiche. As a seiche approaches, an abrupt rise in water level occurs, catching beachgoers off-guard.

A recent example of a seiche is the derecho that passed through the Chicagoland area on July 11, 2011. A derecho is a widespread, convectively-induced, straight-lined windstorm. The July 11th derecho passed through the area shortly before 900 AM, but the beaches that were affected by the resulting seiche did not experience a difference in wave heights until 3-5 hours after the passage of the storm. The waves that affected Waukegan Beach did not peak until 200 PM. Once peaked, wave heights began to return to normal levels through the rest of the afternoon and into the evening hours. The strong winds and the rapid pressure changes associated with the July 11th derecho helped produce this seiche, which generated a two foot water slosh in Lake County, Illinois.

Illinois' worst seiche occurred on June 26, 1954. Under calm winds and a bright sunny sky, a killer wave rose suddenly from a placid Lake Michigan, sweeping 8 unsuspecting fishermen off a breakwater to their deaths. The water level at Montrose Harbor surged more than 10 feet within a few minutes. The seiche was caused by an earlier squall on the lake.

Rip Currents

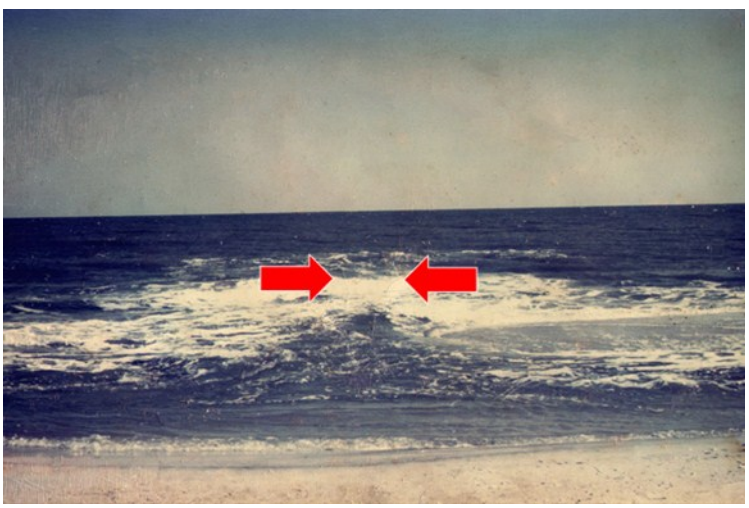
Another way to wreck a beachgoers day is the presence of rip currents. Rip currents are responsible for over 100 drownings nationally each year. The most common rip current incidents in our county warning area occur in Lake County, Illinois, and Porter County, Indiana.

Rip currents consist of a narrow jet of water moving swiftly away from the shore, running perpendicular to the shoreline. They generally occur near shoreline structures (such as piers), complex sandbar terrain, and near river mouths. Thus, it's generally a good idea to avoid swimming near these structures. Rip currents can be narrow or can extend up to hundreds of yards in width.

Rip currents are dangerous because they will pull even the best of swimmers out to deeper water, where swimmers tend to swim against the current in an attempt to get back to shore. Swimmers will thus tire quickly, may not be able to stay afloat, and can drown.

Rip currents can be identifiable at times. If you spot a channel of churning, choppy water, it's best to avoid swimming in that area as that is a good indication of the presence of a rip current. Other "clues" beachgoers can use to avoid the grip of the rip include not swimming in:

- An area of water with a detectable color change.
- A line of foam, seaweed, or debris moving out to sea.
- A break in the incoming wave pattern.



The arrows above indicate the presence of a rip current. A narrow channel of water can be seen floating back towards the sea.

When seeing any of the above features, it's best to stay out of the water. Rip currents are not always easily-identifiable, so if you are doubtful, it's best not to go out.

If you find yourself caught in a rip current, don't panic! In order to get out of the current, swim parallel to the shore. A key thing to remember is never to swim against the current, because even the best swimmers will tire. If you find that you can't escape the rip current, try to tread water or float. If you feel like you will be unable to reach the shore, draw attention to yourself immediately via yelling or waving and stay afloat while you wait for help to arrive.

Tips to avoid rip currents are:

- Never swim alone.
- Swim where a lifeguard is on duty.
- Pay attention to any hazards or warning flags posted by the beach officials.
- Check current forecast for beaches in the area.
- Most importantly, always remember *"When in doubt, don't go out."*

More information on rip currents can be found at http://www.nws.noaa.gov/ripcurrents/

Surf Zone Forecasts

Before heading to the beach, it's always a good idea to look at the forecasted conditions. Surf zone forecasts, issued by the National Weather Service, are text products that provide information regarding the current conditions of local beaches. These forecasts include sky cover, land and water temperatures, winds, wave heights, as well as assess the rip current risk. Rip current risks are assessed in 3 different risk categories: low, moderate, and high.

A low rip current risk means that the current wind and wave conditions are not favorable enough to support the formation of rip currents. However, rip currents can still occur near shoreline structures, such as jetties and piers.

A moderate risk means that the wind and wave conditions are more favorable to produce stronger rip currents that occur more often. It is advised that only strong swimmers enter the water if a moderate risk is issued.

A high rip current risk means that wind and wave conditions are extremely favorable for the formation of strong, "life-threatening" rip currents. Nobody is advised to enter the water if a high risk issued.

If you plan on heading out to the beach, it's always a good idea to check the forecast beforehand. For more information, visit http://www.crh.noaa.gov/product.php?site=LOT&product=SRF&issuedby=LOT.

Turn Around, Don't Drown
by Matt Gillen, Student Volunteer

In most years in the United States, more deaths occur due to flooding than from any other storm related hazard, including severe thunderstorms, hurricanes, lightning and tornadoes. In fact, the 30 year average (1982-2011) shows that there are nearly 20 more deaths each year as a result of flooding than any other hazard. The most dangerous type of floods are known as flash floods, which are short term events, usually occurring within 6 hours of the causative event (heavy rain, dam break, levee failure, etc.). A flash flood can occur when precipitation falls too quickly on saturated or dry soil that has poor absorption ability. This leads to precipitation runoff, which may lead to a rapid rise in creeks and streams, or serious urban flooding, which poses a threat to life and property.

In northern Illinois, flash floods are most common in July and August and result from heavy rain that is often produced by thunderstorms. Flash floods should be taken just as seriously as any other weather related hazard. The majority of flash flood related deaths occur in vehicles. Cars, SUVs, and trucks provide little or no protection against the rapidly rising and rushing waters of a flash flood. Most people underestimate the force and power behind moving water. It only takes 6 inches of moving water to knock a person off of their feet and 18 to 24 inches of water to cause most vehicles to float in water.

The National Weather Service gives the advice "***Turn Around, Don't Drown***," for flash floods. This recommends that people do not drive through flooded roadways or around barricades, even if it is more convenient or a shorter distance to their destination. If an area is completely covered by water, there is no way of knowing the depth of the water or the condition of the ground under the water. Don't risk it, turn around and find another route.

Flash flood safety precautions:

- ⇒ Before heading out, check the local weather forecast at www.weather.gov/chicago or your favorite weather website or news station for vital weather related information.
- ⇒ When you hear thunder or it begins to rain, stay alert for rapidly changing conditions and have a plan in case you notice signs of flash flooding or other severe weather.
- ⇒ Do not let children play near creeks, streams, ponds or other flood prone areas including flooded roadways and storm drains.
- ⇒ Low spots, such as underpasses, underground parking garages and basements can become death traps in a matter of minutes. Evacuate them immediately and find higher ground.
- ⇒ Do not walk, bike, or drive through areas where flooding is occurring, especially if the water is moving fast, as even slow moving water can knock you off of your feet.
- ⇒ If you live near a creek or stream and a flash flood warning is issued by the National Weather Service for your location, you may notice that the stream is rapidly rising. Immediately evacuate the area and head for higher ground.
- ⇒ Do not camp or park your vehicle along streams, especially if there is a chance of rain or thunderstorms in the forecast.
- ⇒ Be especially cautious at night as it is much harder to identify flood dangers.

Find more information regarding floods and flood safety at: http://www.nws.noaa.gov/floodsafety/index.shtml