VALLEY WEATHER WIND

Winter 2009

National Weather Service
Omaha/Valley, Nebraska

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A Newsletter for Emergency Managers, Core Storm Spotters, Media, and Public Officials in Eastern Nebraska and Southwest Iowa

Comments and suggestions are always welcome. Your feedback is very important to us!

Please contact us by telephone, e-mail, or regular mail.

National Weather Service
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Valley, Nebraska 68064

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Chief Editor:

Barbara Mayes

Cooperative Weather Observer Receives Prestigious Award

by Terry Landsvork, Observations Program Leader

Daryl Obermeyer is a model cooperative weather observer. Accurate, precise, timely, and dependable describe this Nebraska volunteer to a "T". Besides managing a large farming operation east of Auburn, Nebraska, Daryl and his wife Jackie give a great deal of their time to organizations in Southeast Nebraska. Daryl is serving or has served in the past on the Nebraska Association of School Boards Membership Committee, the Youth of the Month Coordinator for the Auburn Optimist Club, and as a member of the Auburn Music in the Park Committee. He also served as a volunteer football coach at Peru State College. During his college years at the University of Nebraska in Lincoln (UNL), Daryl's interest in meteorology was piqued while visiting the High Plains Climate Center on the East Campus of UNL.

It was no surprise then that he "jumped at the chance" of becoming a cooperative weather observer in the Summer of 1977. At his farm southeast of Auburn, Daryl uses a NIMBUS electronic temperature measuring system to record daily maximum and minimum temperatures. He uses a Fisher Porter weighing gauge to determine the amount of moisture that falls every 15 minutes and an 8 inch standard precipitation gauge to record daily precipitation amounts. The equipment is furnished and maintained by the National Weather Service. Besides taking daily temperature, rainfall, and snowfall reports, Daryl uses U.S. Geological Survey equipment to measure river levels east of Auburn when the Little Nemaha River threatens to leave its banks.

It should come as no surprise that Daryl, after being nominated by the NWS office at Valley, was selected to receive one of only six Thomas Jefferson Awards presented nationwide in 2008. The Jefferson Award is

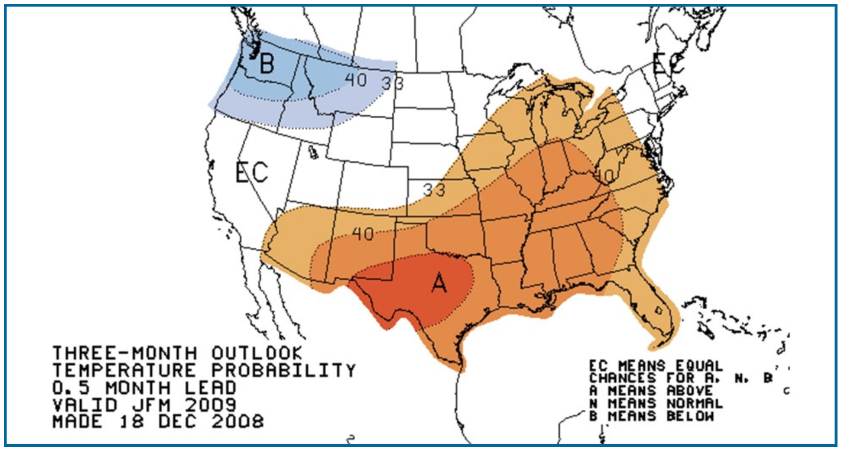
From L to R: Bob Bonack, Terry Landsvork, Daryl Obermeyer, Jim Meyer

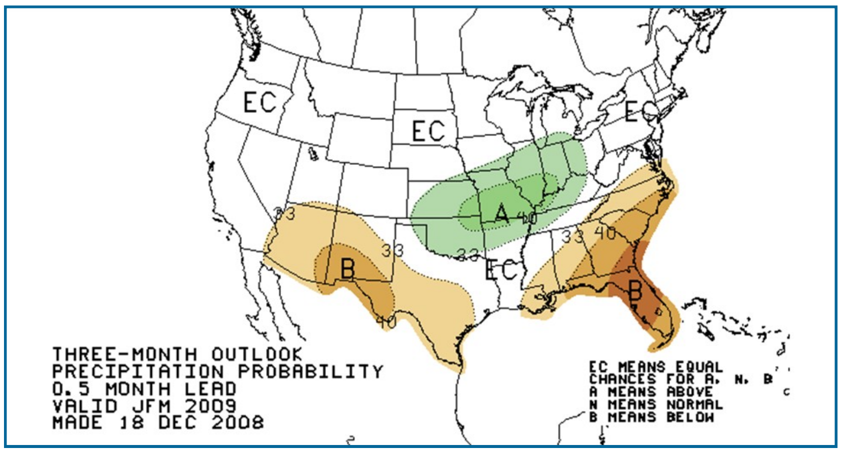
Inside This Issue . . .

Winter Season Outlook

by Barbara Mayes, Meteorologist

For the rest of the winter months (January through March), the National Weather Service's Climate Prediction Center is calling for a slightly higher than usual chance for above average temperatures across much of the Missouri Valley. Closer to northeastern Nebraska, the forecast is for equal chances of being above, near, or below average for temperatures. The winter outlook also indicates a slightly higher than usual chance for above average precipitation in extreme southeast Nebraska and extreme southwest Iowa, with equal chances for above, near, or below average precipitation elsewhere. The chance for above-normal temperatures doesn't necessarily mean that the area will get less snow, however. The "temperatures" that are forecast are an average of the daily highs and lows, which are then averaged over the entire 3-month period. All of this averaging means that the precipitation could happen during colder stretches, or it could mean that the nighttime temperatures are warmer than average while daytime high temperatures are near or below average.





The current ocean temperatures in the Pacific Ocean near the equator are near to just below normal. The current state is known as "ENSO-neutral" conditions, with neither a La Niña nor an El Niño present. However, the ocean temperatures are trending slightly cooler, and the Climate Prediction Center has forecast an equal chance for neutral conditions to continue or for a La Niña to develop. Either way, the weather patterns have "looked" like La Niña patterns already this winter. Since the chance for increased tornadic activity increases in the Plains with a La Niña, the NWS office in Valley will be keeping a close eye on those far-away Pacific Ocean temperatures.

Cooperative Weather Observer Receives Prestigious Award, cont'd

the most prestigious award given to weather volunteers. Bob Bonack from the NWS Central Region Headquarters in Kansas City presented the award during an American Meteorological Society meeting at NWS office in Valley on September 12th. In addition to a number of Daryl's family members, over 100 students, professors, NWS employees and retirees were present at the presentation. Governor Dave Heineman recognized Daryl's outstanding contributions to the Husker State by commissioning Daryl as an Admiral in "The Great Nebraska Navy". Daryl also received the nation's second highest award, the John Campanius Holm Award, in 2003.

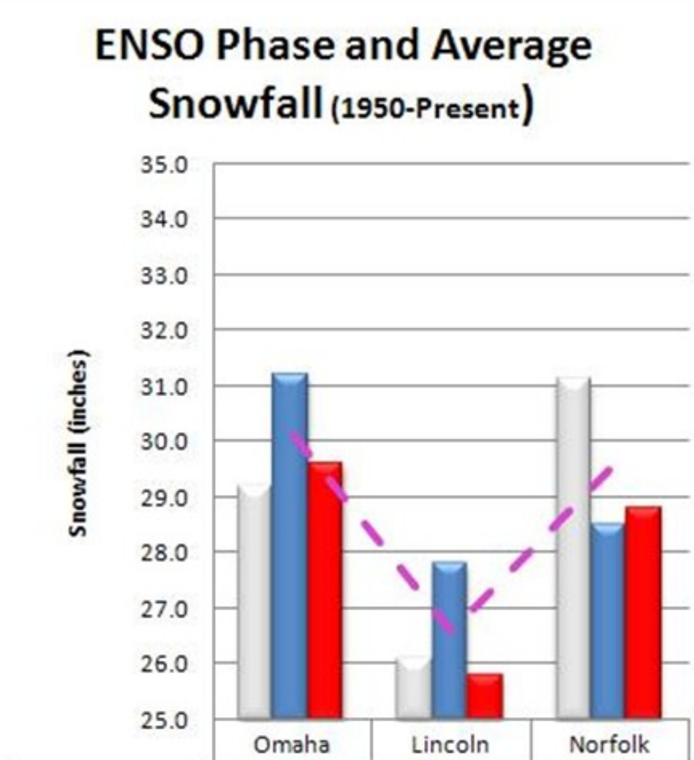
ENSO Phase and Seasonal Snowfall

by Cathy Zapotocny, Meteorologist

Each year we get calls asking, “How much snow will we get this year?” or “What kind of a winter will it be?” Here at the local NWS office in Omaha/Valley, we focus on the short and medium range forecasts (days 1-7); however, the National Weather Service’s Climate Prediction Center (CPC) has the task of making monthly and seasonal forecasts. The CPC uses a variety of data to monitor the current state of the atmosphere and this data in turn is used by computer models to predict the future state of the atmosphere. Over the last 10 to 20 years, with improved data collection, research, and computing resources, the science of long-range seasonal forecasts continues to evolve.

The El Niño-Southern Oscillation (ENSO) phase is one indicator that is used extensively to assist in seasonal forecasts. The phase of ENSO is determined by the ocean temperatures of the Pacific Ocean near the equator. There are three phases of ENSO: La Niña, or below-normal ocean temperatures; El Niño, or above-normal ocean temperatures; and ENSO-neutral, or near-normal ocean temperatures. Depending on the prevailing ENSO phase, there are “typical” weather patterns that are expected. If you can forecast the expected weather pattern, you can better predict where it will be warmer or cooler, or wetter or drier, than normal. The latest expert ENSO discussion from CPC can be found on their website: http://www.cpc.ncep.noaa.gov/.

A local study of ENSO phase and seasonal snowfall shows that amounts vary greatly from year to year. Omaha’s ENSO-neutral phase average snowfall is about an inch less than its overall average snowfall of 30.1 inches (Figure 1). Lincoln’s ENSO-neutral snowfall is also below the overall average snowfall. Norfolk’s ENSO-neutral snowfall is above their average snowfall. However, if you take a look at the 19 ENSO-neutral years for Omaha, the years were split, with 8 years having above-normal snowfall and 11 years having below-normal snowfall (ranging from 8 to 57 inches). For Lincoln, there were 9 years with above-normal snowfall and 10 years below normal (ranging from 9 to 54 inches). At Norfolk, there were 12 years with above normal snowfall and 7 years that were below normal (ranging from 10 to 59 inches).



	Omaha	Lincoln	Norfolk
Neutral	29.2	26.1	31.1
La Nina	31.2	27.8	28.5
El Nino	29.6	25.8	28.8
Snow Avg	30.1	26.6	29.5

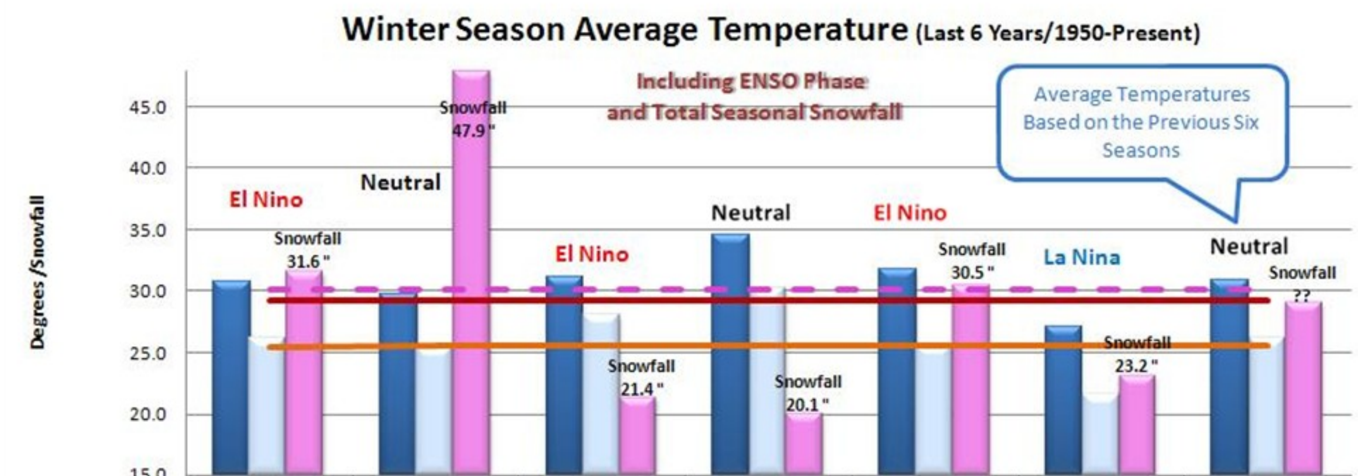
Figure 1. Average snowfall by ENSO phase at Omaha/Eppley, Lincoln, and Norfolk from 1950 to 2008.

Over the last six years, the Omaha area has experienced three El Niño years, two ENSO-neutral years, and one La Niña year (Figure 2). On average over the last six years, temperatures during November, December, and January (NDJ) averaged 30.8 degrees and during December, January, and February (DJF), averaged 26.2 degrees, with a seasonal snowfall average of 29.1 inches. The temperatures were warmer

ENSO Phase and Seasonal Snowfall, Cont'd

than the long-term average since 1950 of 29.3 degrees (NDJ) and 25.5 degrees (DJF) and less snowy compared to 30.1 inches. Finally, the chart shows the large range in snowfall and temperatures between the recent ENSO-neutral years of 2003-2004 (47.9 inches) and 2005-2006 (20.1 inches).

All of the charts illustrate that using ENSO phase alone to predict seasonal snowfall should be done with caution.



	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09
NDJ Act	30.8	29.7	31.1	34.6	31.7	27.1	30.8
DJF Act	26.2	25.4	28.1	30.3	25.6	21.6	26.2
Snowfall	31.6	47.9	21.4	20.1	30.5	23.2	29.1
NDJ Avg	29.3	29.3	29.3	29.3	29.3	29.3	29.3
DJF Avg	25.5	25.5	25.5	25.5	25.5	25.5	25.5
Snow Avg	30.1	30.1	30.1	30.1	30.1	30.1	30.1

Measuring Snow and Snow Water Equivalent

By Terry Landsvork and Barbara Mayes

Measuring snow is a tricky proposition. There are actually four measurements of snow that are used by the National Weather Service: new snowfall, snow depth on the ground, water equivalent of new snow, and water equivalent of the snowpack on the ground. Snow measurements are rarely straightforward, with complications such as wind, rain and freezing rain mixing with the snow, and sleet adding complication. Below are some tips for doing each of the four measurements as accurately and precisely as possible.

New Snow (24-hour total)
24 Hour Snowfall is the maximum accumulation of fresh snow during the past 24 hour period prior to melting or settling. Measure snowfall to the nearest 0.1 (one-tenth) inch. Since snow melts and settles, you may have to measure during or soon after snow ends in order to capture how much accumulated during the 24 hour period. By 7 AM (or your observation time), there may be less. For example, let's say that snow begins to fall mid-morning, accumulates to 4.2" by 3 PM, and then stops and begins melting and settling, such that by 7 AM the next morning you only have 2.6" of snow on the ground. The correct number to report for your 24-hour snowfall (new snow amount) is 4.2" -- the accumulation prior to melting and settling.

Report a TRACE if only snow flurries occur since the previous day's observation.

Measuring Snow and Snow Water Equivalent, Cont'd

Also report a TRACE if the snow accumulated, but to less than 0.1". Many people like to call this "a skiff of snow". Since a skiff is not an acceptable unit of measurement, please call it a TRACE on your report.

The trick in measuring snow consistently is simply finding a good place to measure and a firm surface (such as a snow board) for your ruler to set on. A snow board, which is simply a board painted white, is the best. Some people use low picnic tables, some use their car. We don't recommend sidewalks since they tend to accelerate melting. Melting can also accelerate on cars, especially dark-colored ones or ones that were running and warmed up. Grass is where snow accumulates first, and it is OK to measure on grassy surfaces, but please know that the snow tends to sit up on top of the blades of grass, sometimes by one to three inches. Your ruler, on the other hand, will go right down through the snow and grass to the ground and give you an exaggerated reading. Just be careful to measure to the bottom of the snow and not to the ground.

Measuring new snow accumulation is easy when the snow falls without wind and isn't melting on the ground. But when the wind blows, measuring snow becomes a real challenge. We deal with drifted snow by simply taking many measurements from a variety of locations and averaging them to get a representative measure. If you use a snowboard, take a core sample and then be sure to clear the board after your measurement and set it in a nearby location level on the surface of the new snow. If you leave it down in a depression, it will tend to collect more snow from drifting if the snow continues.

Ice can add a degree of difficulty, too. Sleet is precipitation that falls frozen, in pellets or small balls of ice. It is measured in the same way as snow fall. Freezing rain falls as liquid, but then freezes on contact with surfaces such as sidewalks, porches, and rain gauges. Because it fell as liquid, it is measured with rain (melting the ice to determine the total rainfall) and does NOT count toward total sleet and snow depths.

Snow Depth

At observation (At Ob) snow depth is simply the total depth of snow on ground at your scheduled observation time (usually 7 AM or close). Snow depth is measured to the nearest whole inch. It includes both new and old snow, and should be reported even on days when no new snow has fallen. If necessary, take an average of several measurements. For example, if half the ground has 2" of snow and the other half of the ground is already bare, the average snow depth would be 1". If you determine there is less than 0.5" of snow depth, record a TRACE. Round up to the nearest whole inch if you determine you have 0.5", 1.5", 3.5", etc.

Water Equivalent of New Snow

Snow (and rain, freezing rain, sleet, etc., too) will collect in the 8" diameter outer can (overflow can). (Don't forget to remove those inner tubes during the winter! Some people also have 4" plastic rain gauges, and the same process applies for those gauges, too.) If snow collects on the rim of the gauge you have to decide what belongs in or out of the gauge. Just take a book or flat object and push gently straight down on the top of the gauge. Whatever falls in is in, and whatever falls out is out. It may not be perfect, but at least it's objective. With wet snows, a lot of snow can collect on the rim, so it makes a difference.

Bring the gauge inside at your time of observation. If it has stopped snowing, you can bring it in earlier and just let the snow melt. But you may need to hasten the process. In order to measure the water content of snow, you will need to melt the contents and pour them back into the inner tube.

Measuring Snow and Snow Water Equivalent, Cont'd

One of the best ways to melt the contents is to use the inner tube to pour a measured amount of warm water into the outer can.   Make sure you jot down the amount—don't rely on memory alone! Add that warm water to the snow in the 8" diameter can so that all the snow melts. Then pour the water back into the inner tube and record the total amount (be careful to avoid spilling!). For example, let's say you added 0.51" of warm water to the snow. Then when you measured the total sample, it read 0.82" How much precipitation did you get? The answer should be 0.31":

0.82" - Total of melted snow with the added warm water
-0.51" - Total warm water added to melt snow

0.31" - Daily Precipitation
(the amount you should report)

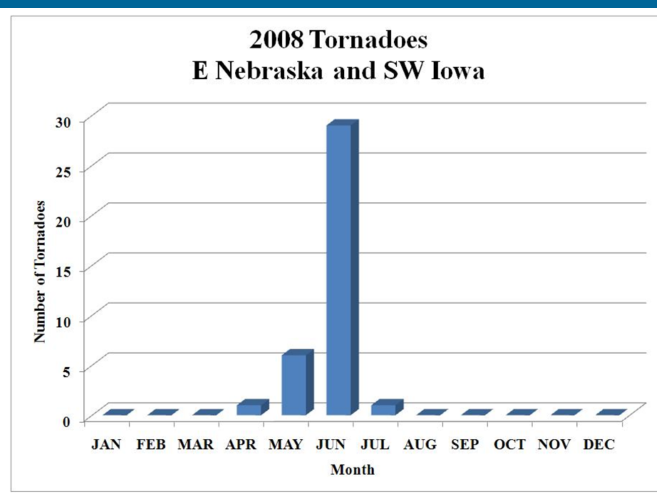
Under some circumstances (primarily strong winds), your gauge will not catch all of the snow that has fallen. You can watch windblown snow crystals curve around a rain gauge like water going around a rock in a river. If you believe your gauge has not adequately caught the precipitation that has fallen (or, if you're just curious), then take a core sample of the fresh snow that has fallen. After first measuring the water content in the gauge, take the 8" outer can and "cut a biscuit" in the fresh snow by pushing it straight down. It is best to do this on your snowboard (after you've measured the snow depth, but before you have cleared the snow and put it back on the surface). Use a thin sturdy object like a spatula, a cookie sheet, or something similar to slide under the can so that you can lift it up without spilling the contents. Then proceed to melt and measure the water content like you would with any other measurement.

Water equivalent of snow pack
A few observers report not only the liquid equivalent of new snow, but also the liquid equivalent of the total snow depth. Be sure to measure in a representative location where the depth of snow is the same as your reported At Ob Snow depth-- not in a drift or in a wind-blown or melted area. Then proceed to melt and measure the water content like you would with any other measurement.

Active Severe Weather Season in 2008

by Brian Smith, Warning Coordination Meteorologist

The 2008 severe weather season was extremely active. In the Omaha/Valley County Warning Area (CWA) of 38 counties, the National Weather Service issued 525 tornado and severe thunderstorm warnings. Between May 20th and July 21st, a 63 day period, 42 of those days had warnings issued by the Valley office. A bulk of the year's tornadoes occurred during this period as well. A record number of tornadoes, 37, occurred in 2008. The previous record was 36 in 1992. The CWA also set a record for the number of tornadoes in June, with 29. This shattered the previous record of 20 tornadoes, which again occurred in 1992.



Active Severe Weather Season in 2008, Cont'd

There were 5 significant tornadoes (EF2 or greater) in the area. The strongest of these was an EF3 tornado at the Little Sioux Scout Ranch tornado on June 11th. Four Boy Scouts tragically lost their lives in the tornado. However, the result could have been much worse. The scouts at the Little Sioux Scout Ranch were well prepared and went to place of safety. The Boy Scout leaders were listening to NOAA Weather Radio and watching the weather closely. When a warning was issued, they alerted the scouts so they could take shelter from the tornado. Other significant tornadoes included two tornadoes that struck Jefferson and Gage Counties on May 29th, an EF2 tornado that struck east of Falls City in Richardson County on June 8th, and one of the early morning tornadoes that struck the Millard area on June 11th.

Perhaps the severe weather event that had the greatest impact was not due to a tornado, but from wind and hail. A strong storm complex with downbursts produced a widespread swath of wind and hail that stretched from North Bend, NE across the Omaha metro area to eastern Pottawattamie and Montgomery Counties in Iowa. The band of winds, at times over 90 mph and with maximum wind speeds estimated at 110-115 mph, along with large hail damaged or destroyed buildings, trees, power poles, and personal property. Two teenage boys lost their lives when a tree fell on their car in Council Bluffs.

Damage to the northwest exterior of the Qwest Center in Omaha

Finally, after July 21st, the severe weather activity diminished dramatically as a hot and dry weather pattern set in. The staff at the National Weather Service in Valley was glad, because many of them had not experienced such an active severe weather season quite some time, and they welcomed a break. What will the 2009 severe weather season be like? Nobody knows, but many people hope it isn't like what has been called "The Siege of '08".

Long-Time Omaha Forecaster John Pollack Retires

John Pollack, who has been at the National Weather Service in Omaha since March 1978, retired on January 3rd, 2009. John's early interest in meteorology was enhanced by a 5th grade tour of the New York City Weather Bureau office in 1963, kindly given by Meteorologist-in-Charge Charles Knudsen. Taking Knudsen's advice to study lots of math and science, John went on to get a B.S. in meteorology at Penn State in 1973, followed by an M.S. at University of Wisconsin in 1976. After applying for NWS positions in 1978, John received a job offer as an intern in the Omaha office, signed by the same Charles Knudsen, who was then Director of the Central Region.

Originally from the East, John had never set foot in Nebraska before his internship at the Omaha office. However, he came to stay, despite the now legendary winters of the late '70s and early '80s. He went on to deal with such events as the floods of 1993 and the October snowstorm of 1997. He became a Lead Forecaster in 1994, at about the same time that the Omaha office modernized and moved to Valley. All together, his career spanned over 30 years, extending from the teletype and fax map era to the AWIPS and multi-computer monitor era.

John plans to stay in the Omaha area with his wife Karen. He expects to continue his hobbies of gardening and bicycling, as well as his interests in long-term forecasting and climate change issues. Congratulations on your retirement, John, and best wishes for everything that lies beyond!

Climatological and Astronomical Data

Compiled by Steve Klemm, Hydro-Meteorological Technician

Climatological Data for October, November, and December 2008

Location	Month	Average	Departure	Rain / Snow	Departure	Highest	Lowest
Omaha	Oct	54.7°	+1.5°	4.55″ / 0.0″	+2.34″	84° (5th)	26° (28th)
	Nov	38.9°	+0.9°	1.56″ / 0.1″	-0.26″	79° (3rd)	12° (21st)
	Dec	22.2°	-3.4°	0.79″ / 5.5″	-0.13″	58° (13th)	-9° (22nd)
Lincoln	Oct	54.5°	+1.0°	4.79″ / 0.0″	+2.85″	84° (5th)	22° (28th)
	Nov	39.8°	+1.7°	1.22″ / T	-0.36″	79° (3rd)	10° (21st)
	Dec	23.1°	-3.4°	0.80″ / 5.5″	-0.06″	61° (26th)	-12° (22nd)
Norfolk	Oct	51.1°	+0.1°	5.13″ / 0.0″	+3.41″	80° (5th)	21° (28th)
	Nov	37.5°	+2.4°	0.90″ / 2.6″	-0.54″	77° (2nd)	8° (21st)
	Dec	18.6°	-5.1°	1.29″ / 15.6″	+0.64″	59° (2nd)	-18° (22nd)

Normal High/Low Temperatures

Location	Jan 1	Feb 1	Mar 1	Apr 1
Omaha	32/12	34/14	44/23	58/34
Lincoln	33/12	35/13	45/22	58/33
Norfolk	31/10	33/12	42/20	55/31

Outlook for January, February, and March

The outlook for January, February, and March calls for a slightly higher than normal chance for above average temperatures, and equal chances for below, near, or above normal precipitation. For additional details and other outlook information, please visit the Climate Prediction Center website at http://www.cpc.ncep.noaa.gov/

Astronomical Calendar

Sunrise/Sunset (http://aa.usno.navy.mil/data/docs/RS_OneYear.html)

	Omaha		Lincoln		Norfolk	
Date	**Sunrise**	**Sunset**	**Sunrise**	**Sunset**	**Sunrise**	**Sunset**
Jan 1	7:50 am CST	5:05 pm CST	7:51 am CST	5:10 pm CST	7:58 am CST	5:09 pm CST
Feb 1	7:35 am CST	5:40 pm CST	7:37 am CST	5:44pm CST	7:43 am CST	5:44 pm CST
Mar 1	6:59 am CST	6:14 pm CST	7:01 am CST	6:18 pm CST	7:05 am CST	6:20 pm CST
Apr 1	7:07 am CDT	7:48 pm CDT	7:11 am CDT	7:51 pm CDT	7:13 am CDT	7:55 pm CDT

Times are given in CDT (Central Daylight Time) and CST (Central Standard Time).

Moon Phases

New Moon	First Quarter	Full Moon	Last Quarter
Dec 27	Jan 4	Jan 10	Jan 17
Jan 26	Feb 2	Feb 9	Feb 16
Feb 24	Mar 4	Mar 10	Mar 18
Mar 26	Apr 2	Apr 9	Apr 17

Daylight Savings Time Begins at 2 am on March 9th, 2009

Spring Equinox (Start of Spring): March 20th, 2009, at 6:44 am CDT