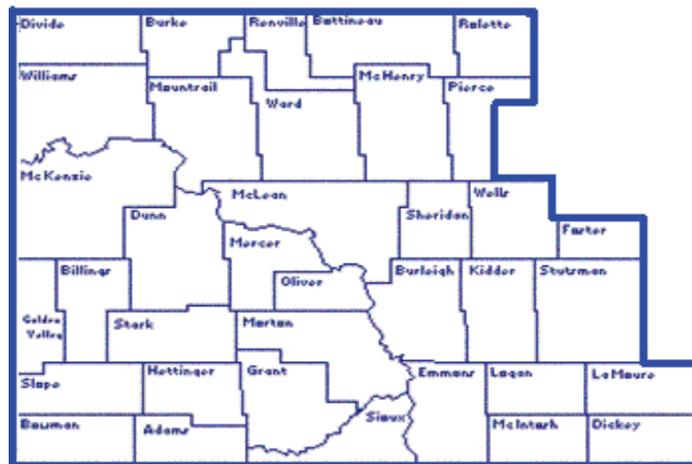


Fall
2008

Dakota Skies

Bismarck North Dakota National Weather Service

A map of the Bismarck CWA (County Warning Area) or area of responsibility. We issue weather products such as warnings and forecasts for 36 counties in western and central North Dakota. The office has 23 employees of which 13 are meteorologists. We are staffed 24 hours a day, seven days a week, year round.



NOAA's NWS Bismarck web site at...
www.weather.gov/bis

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Preparation is key...do it now!

Winter Weather Awareness Week is October 27 through October 31

“Severe Winter Weather Awareness Week” in North Dakota is October 27 through October 31. You should...Get a Kit...Make a Plan...and Be Informed. Keep a high level of situational awareness by listening to the forecast every day. When snow, sleet, or freezing rain is in the forecast expect that it will impact your day to day routine, and be ready when it does!

Now is a good time to re-familiarize yourself with winter terms and safety rules. Prepare now for winter!

About this Publication

Dakota Skies is published twice each year, in the spring and in the fall, by the WCM (Warning Coordination Meteorologist) at your National Weather Service in Bismarck, North Dakota. Its purpose is to heighten awareness about safety for the coming severe weather season, whether it be summer or winter, and to relay information on any changes at the Bismarck NWS (National Weather Service). Additionally, other educational and useful information will be provided as space allows. If you have any comments or suggestions contact us.

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Winter Weather Terminology

Watch is issued when the risk of a hazardous winter weather event has increased, but its occurrence, location, and/or timing is still uncertain.

Warning or Advisory is issued when a hazardous winter weather event is occurring, is imminent, or has a high probability of occurrence. A warning is used when there is a threat to life or property. An advisory is for less serious conditions that cause inconvenience, and, if caution is not used, could lead to situations that may threaten life or property.

Snow criteria for a warning is 6 inches or more in 12 hours or less, OR, 8 inches or more in 24 hours or less. Snow criteria for an advisory is 3 to 5 inches.

Winter Storm Warnings and Winter Weather Advisories may be issued for a combination of elements like snow coupled with wind and blowing snow, or snow coupled with sleet and freezing rain.

Sleet is pellets of ice. Sleet bounces when it hits the ground.

Freezing Rain is rain that freezes when it hits the ground or objects on the ground. It forms a sheet or glaze of ice.

Ice Storm is used to describe occasions when the ice from freezing rain is significant enough (1/4 inch thick or more) to cause damage.

Blizzard is a storm with winds of 35 mph or higher AND visibility frequently below 1/4 mile in snow and/or blowing snow AND these conditions last three (3) hours or longer. There is no set temperature requirement for a blizzard.

Wind Chill is that part of the cooling of a human body caused by moving air. Moving air accelerates the rate of heat transfer away from a human body.

Wind Chill Advisory is issued for wind chills of 20 to 40 below zero with a wind speed of at least 10 mph.

Wind Chill Warning is issued for wind chills lower than 40 below zero with a wind speed of at least 10 mph.

wind chill table

wind speed down left side - temperature across top

	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Be Prepared

In the cold dress in layers of loose fitting clothes. Wear a hat, gloves or mittens, and a scarf. Have as little skin as possible exposed to the elements.

When shoveling snow go slow, take breaks, and don't get too tired. Keep fire hydrants near your home or business visible and free of snow.

Carry a winter survival kit in your vehicle. Include extra clothing, a blanket, and high energy food like candy bars, peanuts, and raisins. Have a flash light with fresh batteries, paper towels, sand, and a shovel. Keep the gas tank and windshield washer bottle full.

Before you set out on a trip let someone know the time you leave, the route you will take, and the time you plan to arrive. Check the latest forecast and road report. Take a cell phone and be sure the vehicle windows, headlights and taillights are clear of snow, ice, and frost.

If you get stuck, raise the vehicle antenna and tie a brightly colored cloth to it so that others passing by will see you. Keep the exhaust pipe clear of snow but do not overexert yourself by trying to push or shovel the vehicle out of deep snow. Keep a window open about a half inch. Clap your hands and rub your legs. Move your body around in the vehicle. Stay inside the vehicle. Do not try to walk away from the vehicle unless you can see a place of safety at a close distance. Do not fall asleep! Stay awake!

Winter 2008-2009 Outlook

www.cpc.ncep.noaa.gov

NOAA's CPC (Climate Prediction Center) 2008-2009 Winter Outlook issued October 16 calls for above normal temperatures and normal precipitation for North Dakota.

This CPC outlook is an average over the three month period called Meteorological Winter, namely December, January, and February. As always we need to be mindful that March and April can bring big storms through the state.

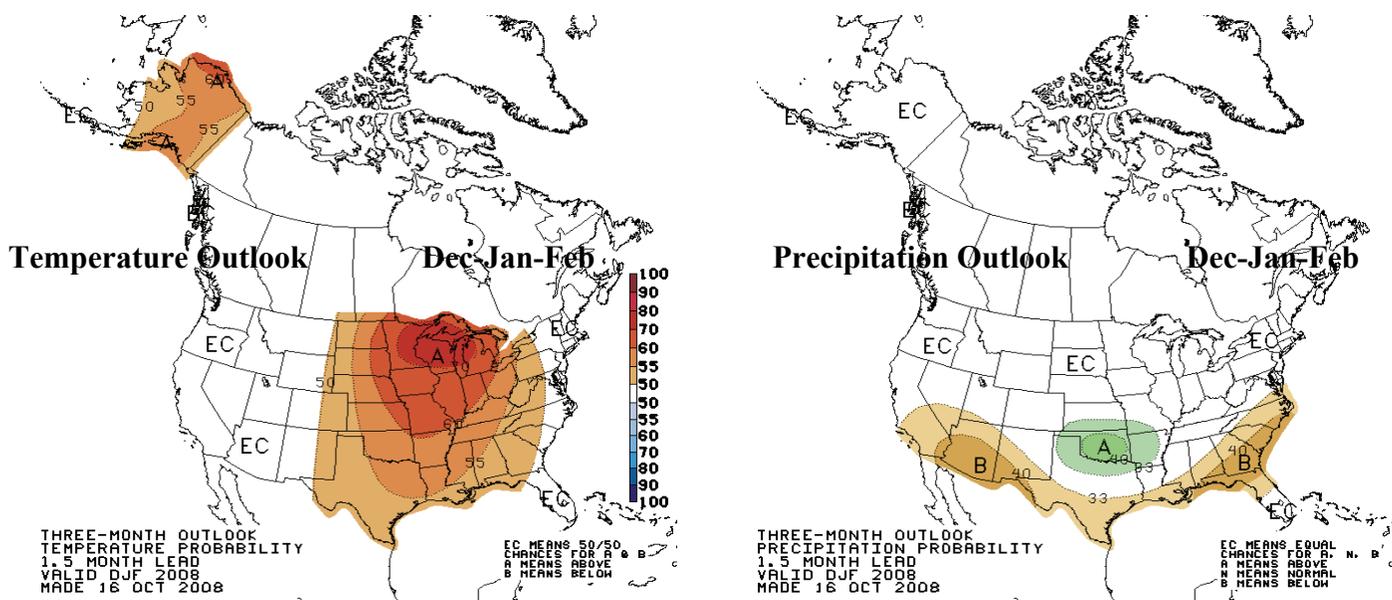
Remember that although this long term forecast is firmly based on the science of meteorology, along with climatology factored in, as with any forecast it is subject to change.

Through the winter over western and central North Dakota average maximum (high) temperatures are in the 20s, and average minimum (low) temperatures are zero to 5 above. Snowfall during this period averages around 20 inches. Note that these numbers are for December through February only. If we take the entire "snow" season, which usually starts in mid October and runs through April, average snowfall is around 40 inches.

The winter 2008-2009 outlook from the CPC calls for near Neutral ENSO (El Nino Southern Oscillation) conditions within the Tropical Pacific region. When ENSO conditions are "Neutral", it means there will likely be little to no impact across the United States. However, in spite of this, the official temperature forecast from the CPC calls for an enhanced chance for observing above average temperatures across North Dakota this winter. This is likely due in large part to the milder than normal weather observed in winter season temperatures over the past several years, and no indication of a colder than normal winter for North Dakota. As far as winter precipitation is concerned, there is currently no strong signal to indicate whether there will be more or less than average amounts. It is worth noting, however, that the last five comparable Neutral ENSO events have produced slightly below normal winter precipitation across most of the state.

The bottom line forecast for North Dakota is for above normal temperatures this winter season, and normal or just below normal precipitation amounts.

Finally, it is always important to keep in mind that these forecasts are meant to represent the whole winter season, not a day to day forecast. Tremendous day to day variability exists throughout the winter. As we all know, it would not be winter in North Dakota without a few big storms and some bitterly cold arctic outbreaks. There will be snowy days and cold days, just like every winter in North Dakota.



Valuable Web Sites

NWS Bismarck at
www.weather.gov/bis

NWS Grand Forks at
www.weather.gov/fgf

North Dakota Department of Emergency Services at
www.nd.gov/des

North Dakota Department of Transportation at
www.dot.nd.gov

North Dakota Highway Patrol at
www.nd.gov/ndhp

North Dakota Game and Fish at
www.gf.nd.gov

North Dakota Parks & Recreation Department at
www.parkrec.nd.gov

North Dakota State Fire Marshal at
www.ag.state.nd.us/FM/FM.htm

Citizen Corps at
www.citizencorps.gov

Don't Be Late...or Early

Sunday, November 2, 2008...2 AM CDT becomes 1 AM CST. Fall BACK one hour.

Sunday, March 8, 2009...2 AM CST becomes 3 AM CDT. Spring AHEAD one hour.

The Energy Act of 2005 changed the time change dates for DST (Daylight Savings Time) in the United States. DST begins on the second Sunday of March and ends on the first Sunday of November.

Road Reports and other DOT information...dial **511**

**Winter Officially Begins at
6:04 AM CST on December 21, 2008**

**Spring Officially Begins at
6:44 AM CDT on March 20, 2009**

Severe Summer Weather 2008 Review

By definition a *severe thunderstorm* is one that produces a 58 mph (50 knot) wind gust and/or 0.75 inch diameter hail. A penny is 0.75 inch diameter.

A *tornado* is a violently rotating column of air in contact with the ground (visible funnel not necessary).

A *Flash Flood* results from too much water in a short period of time where flooding occurs very quickly, or in a "flash".

The Enhanced Fujita (EF) tornado damage scale:

<u>EF-rating</u>	<u>tornado intensity</u>	<u>wind speed</u>
EF0	weak	65 to 85 (mph)
EF1	weak	86 to 110
EF2	strong	111 to 135
EF3	strong	136 to 165
EF4	violent	166 to 200
EF5	violent	201(+) mph

During the 2008 severe weather season the National Weather Service in Bismarck officially logged the following reports for the Bismarck CWA (County Warning Area) (see map page 1): (see page 6):

247 large hail (0.75 inch diameter or larger)
(compared to 162 in 2007)

70 high wind (58 mph or higher)
(compared to 89 in 2007)

19 tornadoes
(compared to 15 in 2007)

4 flash floods
(compared to 8 in 2007)

The first report of severe summer weather in 2008 was 1.00 inch diameter hail (quarter size), in a path from 4 miles south-southeast of Ellendale, to 7 miles west of Oakes, **Dickey County**, on May 24. Interestingly, three tornadoes occurred in **Dickey County** that day as well. Also on May 24, large hail and two tornadoes occurred in **Morton County**. This severe weather outbreak across western and central North Dakota was the first of the 2008 severe weather season. Usually the first reports of severe weather come in April, so for the first reports to be in late May was a late start.

The largest hail stone reported was 4.25 inches in diameter. The public reported that hailstones this size fell from 6:22 PM MDT to 6:28 PM MDT on June 18, 5.1 miles southeast of Stanton, **Mercer County**.

The highest wind gusts were in the wake of thunderstorms (following them) that moved through **Stutsman, LaMoure, and Dickey** counties in the early morning hours of June 11. Thunderstorms moved through and immediately after their passage wind speeds gusted to 85 mph over this three county area between 3:00 AM CDT and 8:00 AM CDT.

There was also some lightning damage reported this year. Lightning damaged a home near Menoken, **Burleigh County**, on July 16, and a home 3 miles north of Dickinson, **Stark County**, on August 10.

Flash flooding occurred in **Bowman County** on June 2, **McLean County** on July 30, and in **Rolette** and **Wells** counties on August 21 and 22.

See “The Belcourt-Rolla Tornado of July 7, 2008” on page 7.

Details on the 19 tornadoes: (rating-date-county-location-deaths-injuries-damage)

- 1 EF0 May 24 Dickey County 6SW-2SW Guelph
- 2 EF0 May 24 Dickey County 4NW Guelph-7W Oakes
- 3 EF0 May 24 Dickey County 3W Oakes-1NNE Glover
- 4 EF1 May 24 Morton County 6SSW-2W New Salem (damage...no deaths or injuries)
- 5 EF0 May 24 Morton County 2NW-3N Sweet Briar
- 6 EF0 June 18 Morton County 1-1.1E Sweet Briar
- 7 EF0 June 18 Morton County 7SSE Lyons-6.9WSW Mandan Airport
- 8 EF0 July 7 Bottineau County 11.4 ENE Roth-11.7 NNE Bottineau Airport
- 9 EF0 July 7 Rolette County 7N Dunseith-1SSE Kelvin
- 10 EF3 July 7 Rolette County 5.4ENE San Haven-3.3ENE Rolla (damage...no deaths, 3 injuries)
- 11 EF0 July 10 Grant County 1NNW-1NNE Lark
- 12 EF0 July 10 Burleigh County 5ESE-5.5ESE Baldwin
- 13 EF0 July 19 Dunn County 17NNE Dunn Center-14.2 N Werner
- 14 EF0 July 28 Burleigh County 2NE-4ESE Baldwin
- 15 EF0 Aug 11 Burleigh County 3NW-2NNW Menoken
- 16 EF0 Aug 11 Sheridan County 3.7 SW-2.7SSW Pickardville
- 17 EF0 Aug 11 McHenry County 4.5E-5.5E Voltaire
- 18 EF0 Aug 11 McHenry County 1SE-2SE Karlsruhe
- 19 EF0 Aug 11 McHenry County 4SW-4SSW Balfour

.The Belcourt-Rolla Tornado of July 7, 2008

By North Dakota standards this was a long lived tornado that covered many miles.

A National Weather Service storm damage survey was completed in Rolette County on July 8, the day following the event. The storm survey concluded that the total path length was 17.6 miles, with a maximum width of 250 yards. The worst damage corresponded to low end EF3 on the Enhanced Fujita Scale, with maximum estimated winds of 140 mph.

Multiple tornado sightings were reported by local officials and residents along Bureau of Indian Affairs (BIA) Highway number eight between 2:50 PM CDT and 3:10 PM CDT. The storm survey concluded that tree and structural damage along this corridor west and northwest of Belcourt corresponded to EF1 and EF2 on the Enhanced Fujita scale, or wind speeds ranging from 90 to 130 mph, with a path width ranging from 50 to 75 yards. Greater damage was surveyed north and northeast of Belcourt. Along BIA Highway number seven, a tornado path width of 250 yards was observed with significant widespread tree damage, corresponding to an EF2 rating or winds of 115 to 130 mph. Northeast of Belcourt along BIA highway number five, a home sustained heavy damage and there was one injury. Here, a rating of EF2 was assigned, with estimated wind speeds up to 135 mph. Storm reports around the immediate Belcourt area indicate a time of approximately 3:15 PM CDT for tornado impact. Seventy structures in total were impacted in the Belcourt area with varying degrees of damage.

The tornadic storm continued east hitting the north side of the city of Rolla at approximately 3:30 PM CDT. Twelve homes were destroyed and 18 homes were damaged. The homes with the most significant structural damage corresponded to an EF3 rating. From this it was determined that the maximum wind speeds here were on the order of 140 mph. Two minor injuries were also reported in the Rolla area. The tornado continued east-southeast, hitting a farmstead east of Rolla which sustained structural and tree damage consistent with an EF2 tornado, or winds around 125 mph. The tornado then crossed US Highway 281 before pushing southeast into Towner County, where it weakened and dissipated.

This information was compiled through various sources.



Western and central North Dakota NOAA Weather Radio All Hazards Stations

Bismarck 162.475 MHz	Dickinson 162.400	Jamestown 162.550	Kidder County 162.400
Minot 162.400	New Town 162.525	Rolla 162.475	Scranton 162.525
Williston 162.550	Willow City 162.450		

Also serving parts of west and central North Dakota...

Baker MT 162.550	Bath SD 162.475	Firesteel SD 162.425	Ft Ransom ND 162.525
Lowry / Mobridge SD 162.500		Sheyenne ND 162.525	



SKYWARN Recognition Day 2008

SRD (SKYWARN Recognition Day) for 2008 has been set for December 6. It will run from 0000 UTC (Universal Coordinated Time) to 2400 UTC. That corresponds to 6 PM CST on December 5, to 6 PM CST on December 6. This will be the 10th annual SRD.

SKYWARN is a national network of severe weather spotters. It is basically volunteers, who are trained in severe weather observing, and report information to the National Weather Service. In this way the spotters become a critical component of the Warning and Decision making process that goes on at the NWS. SKYWARN really is one neighbor helping another in the protection of life and property.

SKYWARN Recognition Day celebrates the contributions that amateur radio operators make to the National Weather Service severe weather operations, and consequently to the public welfare.

U.S. Department of Commerce National Oceanic and Atmospheric Administration

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