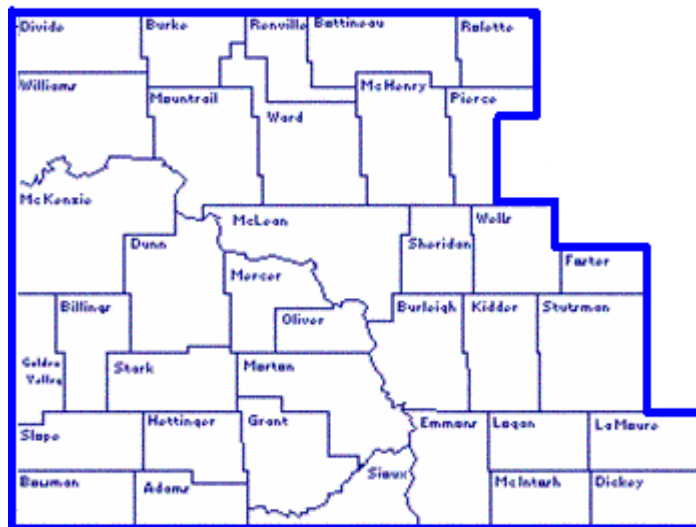


Fall
2005

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.



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Winter Weather Awareness Week is October 31 through November 4

“Severe Winter Weather Awareness Week” in North Dakota this year will be October 31 through November 4. 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 have an affect on your day to day routine.

Now is a good time to re-familiarize yourself with winter terms and safety rules. Prepare yourself, your family, and your home and vehicles for the coming 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. Additionally, other educational and useful information will be provided as space allows. If you have any comments or suggestions contact the Bismarck NWS.

John Paul Martin, WCM
NOAA-NWS
PO BOX 1016
Bismarck, ND 58502-1016
701-250-4495

web site... www.weather.gov/bis

MIC-Meteorologist-In-Charge
Jim Fors (jim.fors@noaa.gov)
WCM-Warning Coordination Meteorologist
John Paul Martin (john.paul.martin@noaa.gov)
SOO-Science Operations Officer
Vic Jensen (viggo.jensen@noaa.gov)
ESA-Electronics Systems Analyst
Karl Venneberg (karl.venneberg@noaa.gov)
OPL-Observation Program Leader
Len Peterson (leonard.peterson@noaa.gov)
SH-Service Hydrologist
Charlene Prindiville
(charlene.prindiville@noaa.gov)

Inquires at 701-223-4582
Weather and a forecast at 701-223-3700

NWS Williston Contacts

NOAA-NWS
402 Airport Rd
Williston, ND 58801-9802
Inquires at 701-572-3198
Forecast at 701-572-2351

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 snow criteria, or 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 portion 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 wind speed of at least 10 mph.

Wind Chill Warning is issued for wind chills lower than 40 below zero with 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 Officially Begins at
12:35 PM CST on December 21, 2005**



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

511

TIME CHANGE IS COMING!!

**Sunday, October 30
2AM becomes 1AM**

“Fall back” one hour.

*NOAA Weather Radio...
isn't just for weather
anymore...*

NOAA All Hazards Radio

**Spring Officially Begins at
12:26 PM CST on March 20, 2006**



Severe Summer Weather 2005

The 2005 severe summer weather season was extremely active in western and central North Dakota.

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).

The Fujita tornado damage scale:

<u>F-rating</u>	<u>tornado intensity</u>	<u>wind speed</u>
F0	weak	40 to 72 (mph)
F1	weak	73 to 112
F2	strong	113 to 157
F3	strong	158 to 206
F4	violent	207 to 260
F5	violent	261 to 318

During the 2005 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):

202 large hail (0.75 inch diameter or larger)
59 high wind (58 mph or higher)
17 tornadoes
37 flash floods



What a Storm-June 19, 2005

In the very early morning hours of June 19 a complex of storms moved into southwest North Dakota and produced 1.00 inch diameter hail at Rhame. This same complex moved northeast and rapidly increased. As it passed over the Dickinson airport the ASOS (Automated Surface Observing System) measured a 73 knot (84 mph) wind gust. It also hammered Dickinson with 3.00 inch hail. Damage was estimated at more than \$3 million in the city. As the complex moved through Mercer County it pushed 60 mph wind through Beulah and dumped 2.25 inch hail in Hazen. Large hail then fell at Center (1.75 inch), Washburn (0.88 inch), and south of Minot (1.75 inch). This storm complex then intensified again as it moved into Pierce County. Six miles of 230 KV high voltage transmission lines were torn down as 110 mph wind gusts rushed out from the system. Finally, a tornado dropped down in the Long Lake area and moved into Benson County. Damage in Pierce County was estimated at \$2 million.

In total 29 severe thunderstorm warnings and 8 tornado warnings were issued by the National Weather Service in Bismarck. This incredible storm complex adversely affected no fewer than 17 counties as it tore a 270 mile swath from southwest North Dakota, through the central, and into the northeast.

Flash Floods Hit Hard in 2005

In an average season western and central North Dakota has about four (4) flash flood events. In 2005 there were 37!

June 1-2 were busy days as flash flooding caused a million dollars in damage across McLean, Ward, Renville, McHenry, and Bottineau counties. Impact was greatest in Bottineau County as Souris had six (6) inches of rain in just a few hours, and in Ward County where 10 bridges were damaged.

Flash floods hit Sioux County hard on June 7-8. Damage was estimated at almost \$150,000.

On June 7-8 four inches of rain in a short period of time sent a wall of water three feet high into lower parts of Edgeley, LaMoure County. At the same time water was reported a foot deep over roads just south of Merricourt in neighboring Dickey County. Damage was estimated at over \$1 million.

Dates and locations of the 17 tornadoes:

F1 June 1 Hettinger County 11S to 5E Mott
F1 June 1 Hettinger County 1W to 16N Burt
F1 June 1 Stark County 5SE to 6S Lefor
F0 June 3 Grant County 5N to 6N Lark
F1 June 6 Stark County Belfield to 1NE Belfield
F1 June 6 Burleigh County Lincoln
F0 June 7 Emmons County 19W Strasburg
F0 June 7 Dickey County 2S Merricourt
F1 June 19 Pierce County 8S to 8SSE Silva *
F0 June 26 Sioux County 13SW to 11SW Solen
F0 June 26 Sioux County 4SW to 2SW Solen
F1 June 26 Hettinger County 4S to 2E Mott
F1 June 26 Hettinger County 3S to 2E Burt
F0 July 1 Ward County 3N Kenmare
F0 July 2 Renville County 3W Sherwood
F0 July 10 Pierce County 4NW Selz
F0 August 17 Logan County 2E Fredonia

* The F1 tornado in Pierce County on June 19 crossed into Benson County (Grand Forks NWS area).

The first report of severe summer weather in 2005 was 0.75 inch diameter hail (penny size) that fell 9 miles northeast of Drake, McHenry County, on April 17.

The largest hailstone was 3.00 inch diameter. Two different storms produced 3.00 inch hail. The first was at Dickinson, Stark County, on June 19 and the second was 5 miles north of Fairfield, Billings County, on July 16.

The highest thunderstorm wind gust was 110 mph (96 knots) that tore through Pierce County during the early morning hours of June 19th.

The last report of severe summer weather in 2005 was 0.88 inch diameter hail (nickel size) that fell in Minot, Ward County, on September 16.

NWS Bismarck web site at...
www.weather.gov/bis

A Snowstorm of Historic Proportions

The winter season of 2005-2006 arrived early for a lot of folks in western and central North Dakota. October 4-5, 2005, brought an early and very significant winter storm to an extensive area of western and northern North Dakota. The same harsh winter storm also hit parts of South Dakota, Wyoming, and Montana. Southern Saskatchewan and southern Manitoba did not escape the storm either. Heavy wet snow pulled down trees and power lines, halted transportation, and disrupted the lives of thousands. In many areas you needed a yardstick to measure the snow!

Power outages were reported in Bottineau, Bowman, Burke, Dunn, Golden Valley, McHenry, McKenzie, McLean, Oliver, Rolette, Sheridan, and Ward counties. It was estimated that 14,000 people in North Dakota alone were without power because of the storm.

Here are the snow reports in to the NWS in Bismarck. Amounts are in inches, rounded to the nearest inch.

Beach...15 inches
Bismarck...1
Bottineau...10
Bowman...15
Center 8 miles southeast...5
Dickinson...15
Dunn Center...19
Dunn Center 4 miles south...22
Fairfield...17
Grassy Butte...14
Halliday...15
Harvey...6
Hebron...18
Lake Metigoshe...11
Lansford...7
Minot...15
New Salem...9
Powers Lake...13
Richardton...15
Stanley 13
Tioga...16
Trotters...14
Underwood...8
Velva...5
Washburn...5
Watford City...9
Williston...5

To have this much snow, so early in the season, over such a large part of North Dakota, was indeed historic and record breaking.

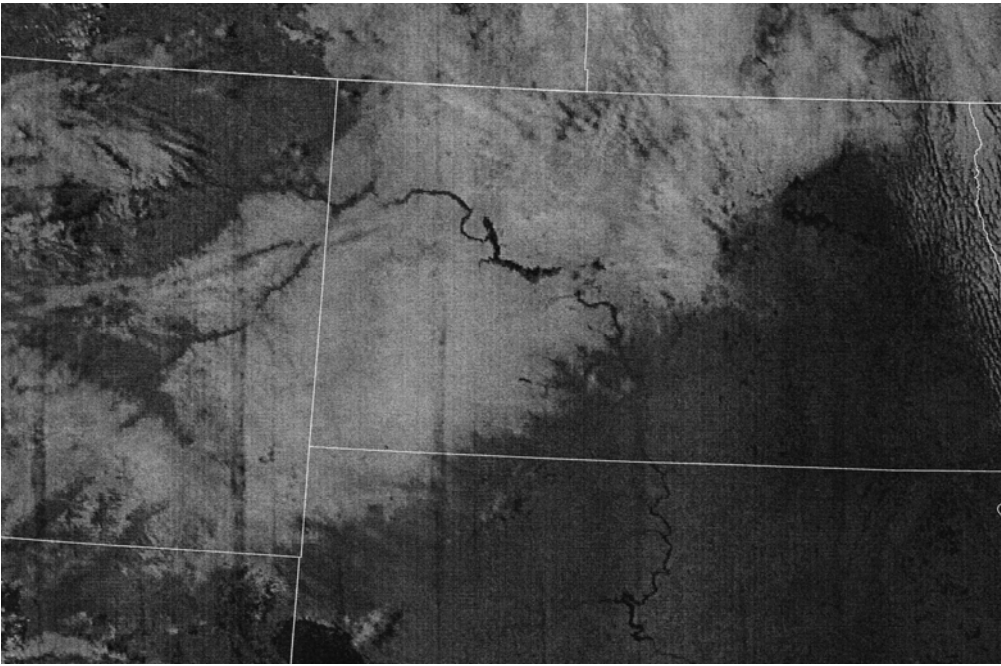
Transportation came to a standstill as the storm forced the closure of major highways. Interstate 94 was closed from Mandan to the Montana state line, a distance of about 155 miles. Other major highways including 83, 52, 5, and 2 were made impassable by the storm and had to be shut down. The county sheriff in no fewer than 28 counties advised no travel as drifts were reported as deep as four feet. Snow plow operators were ordered off the roads as concern for their safety grew.

National Guard soldiers were called out to rescue stranded motorists. Hundreds of motorists and occupants of three buses were rescued. Over a 23 mile stretch of Interstate 94, from Dickinson to Richardton, 100 vehicles with folks inside were stranded. In Dickinson snowplows accompanied emergency vehicles to emergencies.

The storm was preceded on October 1st by temperatures in the 90s. Trotters and Killdeer had 90 degrees, Williston, Turtle Lake, Dickinson, and Bowman all had 91, Bismarck, Linton, Flasher, Halliday, and Hettinger all had 92, New Salem had 94, Taylor 7NNW had 95, and Beulah had 96 degrees.

The storm was followed by record cold as temperatures over snow covered areas plummeted. On October 6 Dickinson fell to 11 degrees and Williston fell to 12. Both were record lows for the date. Other lows for the 6th included 18 at Underwood, 15 at both Watford City and Halliday, 13 at New Salem, and 4 degrees at Powers Lake.

A check of records back to 1874 showed that North Dakota has had snow even in September. For example Bismarck had 5 inches of snow on September 23-24, 1984, 4 inches on September 25, 1942, and 2 inches on September 12, 1903. Until the storm this year, though, the earliest most significant storm to affect such a large part of North Dakota had been 6 to 13 inches on October 7-8, 1985. The storm this year came a few days earlier in the season and dumped more snow than the 1985 one, with 15 inches being common. Indeed the storm of October 2005 is record breaking and of historic proportions.



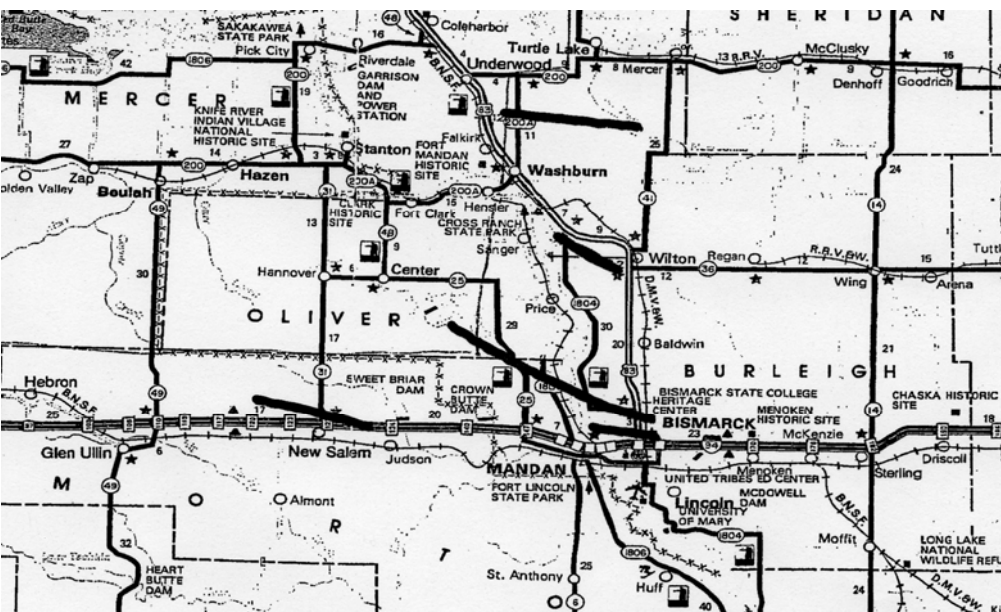
Visible satellite picture taken October 7, 2005 showing the snow on the ground (large white area) in North Dakota. Note Lake Sakakawea and the Missouri River standing out.

Latest Tornado on Record

The 5 year anniversary of the latest tornado to occur in North Dakota (calendar year) is fast approaching. On November 1, 2000, five separate and distinct tornadoes struck the Bismarck/Mandan area. Weather records indicated that the latest tornado in North Dakota had been on October 11 in Sargent County in 1979. Tornadoes in November were unprecedented as far as weather records were concerned. A deep upper level low pressure system centered south of Bismarck forced the tornadoes to track from southeast to northwest, not the typical direction we expect them to move. At the same time the tornadoes were occurring a blizzard was raging on the Montana border. Records were broken and history was made on November 1, 2000. As they say, records are made to be broken.

The 5 tornadoes...

- F1 6 north to 10 north-northwest Bismarck 155 PM to 205 PM (Burleigh) 42 homes damaged...2 injuries
- F2 10 north Bismarck to 14 southeast Center 233 PM to 350 PM (Burleigh-Morton-Oliver) 1 home damaged
- F0 3 west-southwest Wilton to 8 southeast Washburn 305 PM to 320 PM (Burleigh-McLean)
- F0 3 east to 9 northwest New Salem 343 PM to 358 PM (Morton)
- F0 8 southwest Mercer to 11 north Washburn 358 PM to 430 PM (McLean)



A map showing the 5 tornado paths.



SKYWARN Recognition Day 2005

SRD (SKYWARN Recognition Day) for 2005 has been set for December 3. It will run from 0000 UTC (Universal Coordinated Time) to 2400 UTC. That corresponds to 6 PM CST on December 2nd to 6 PM CST on the 3rd. This will be the 7th 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.

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

NOAA-National Weather Service
PO Box 1016
Bismarck ND 58502-1016

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