



# North Dakota Climate Bulletin

Winter 2011-2012

Volume: 6 No: 1

## In This Issue

- From the State Climatologist
- Weather Highlights: Seasonal Summary
- The Season in Graphics: Winter 2011-2012 Weather in North Dakota
- Storms & Record Events: State Tornado, Hail, and Wind Reports & Record Events
- Outlook: Spring 2012
- Hydro-Talk: Pendulum swing of Hydrological Extremes in North Dakota
- Science Bits: New USDA Hardiness Zone Map
- 



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## From the State Climatologist



The North Dakota Climate Bulletin is a digital quarterly publication of the North Dakota State Climate Office, the College of Agriculture, Food Systems and Natural Resources, North Dakota State University in Fargo, North Dakota.

Compared historically, North Dakota had a warmer and drier winter. Temperature-wise, this winter was the 5<sup>th</sup> warmest statewide since 1895. Precipitation-wise, it was the 25<sup>th</sup> driest winter statewide since 1895. Even though February was near normal, overall winter precipitation was still well below normal.

Unusually dry fall statewide followed by a dry winter season lessened some of the flooding concerns North Dakotans had during the last three years. However, it also allowed some abnormally dry conditions sneak in from the east. By the end of the winter, nearly 15% of the state (mostly confined to the eastern North Dakota along the Red River Valley) was under moderate drought based on the US Drought Monitor categorization.

The North Dakota total precipitation amounts as a percentage of the normal and average temperature departure from normal are shown on pages 6 through 8 (Season in-Graphics) followed by the time series of monthly total precipitation and average temperature of North Dakota for respective months of the season.

This bulletin can be accessed at <http://www.ndsu.edu/ndsco/>. This website hosts other great resources for climate and weather information.

Adnan Akyüz, Ph.D.  
North Dakota State Climatologist



Hoar Frost: by Akyüz



# Weather Highlights



## Seasonal Summary:

by B. A. Mullins

### December 2011

The state average precipitation was 0.21 inches which is below the 1981-2010 normal of 0.52 inches. December 2011 state average precipitation ranked 13<sup>th</sup> driest in the last 117 years with a maximum of 1.29" in 2008 and a minimum of 0.06" in 1944.

The High Plains Regional Climate Center (HPRCC) December percent of normal precipitation was less than 80% for most of North Dakota. The southwest corner had the greatest amount of precipitation with 150% to 200% of normal. December continued a pattern of dry and seasonally warm temperatures. The precipitation events from the 1<sup>st</sup> through the 26<sup>th</sup> produced amounts of a trace to around a tenth of an inch with the east being the driest. Snow depth from the 1<sup>st</sup> through the 26<sup>th</sup> varied from a trace in most areas to an inch in the northern regions. The 27<sup>th</sup> through the 31<sup>st</sup> had precipitation fall in most areas with the highest amounts in the northeast.

The National Weather Service (NWS) recorded breaking no precipitation records in December. A list of winter records can be viewed in the "Storms and Record Events" section later in this bulletin.

The US Drought Monitor January 3, 2012 report had the eastern edge of North Dakota with Moderate drought conditions and the remainder of the state had abnormally dry conditions.

The USDA, National Agricultural Statistics Service, North Dakota Field Office reported an average snow depth of 0.2 inches on January 1. Road conditions were rated 97% open, 3% difficult, 0% closed with 0% drifted, 16% icy, 1% muddy, and 83% dry. (Weekly Weather and Crop Bulletin Vol. 99, No. 1).

According to the preliminary reports of the National Weather Service's Storm Prediction Center (SPC), there were no severe weather reports of wind, hail or tornadoes in December.

The top five December daily maximum wind speeds recorded from NDAWN were 54.1 mph at Pillsbury on the 31<sup>st</sup>, 49.8 mph at Robinson on the 26<sup>th</sup>, 49.4 mph at Watford City on the 26<sup>th</sup>, 48.7 mph at Edgeley on the 26<sup>th</sup> and 48.3 mph at Linton on the 26<sup>th</sup>. NDAWN wind speeds are measured at a height of 10 feet (3 m).

The state average air temperature was 22.5 °F which is above the 1981-2010 normal of 14.02 °F. December 2011 state average air temperature ranked 6<sup>th</sup> warmest in the past 117 years with a maximum of 25.6 °F in 1939 and a minimum of -2.5 °F in 1983.

NDAWN December average air temperatures ranged from 19 °F to 25 °F. NDAWN departure from normal temperatures were above normal across the state and ranged from 6 °F to 13 °F. The 4<sup>th</sup> through the 9<sup>th</sup> had near normal to below normal temperatures across the state. The majority of all other days had above normal to far above normal average air temperatures across the state. The National Weather Service reported breaking or tying high temperature records on

the 18<sup>th</sup> and the 26<sup>th</sup>. Bismarck December average air temperature ranked 8<sup>th</sup> warmest with 25.1 °F (tied with 1991). Williston December was the 7<sup>th</sup> warmest with 25.0 °F. Fargo December was 3<sup>rd</sup> warmest on record with 25.3 °F and Grand Forks was 3<sup>rd</sup> warmest with 22.2 °F. Similar to November, the lack of or sparse snow pack contributed to the warm temperatures.

The National Weather Service (NWS) reported breaking several high temperature records from the 18<sup>th</sup> through the 28<sup>th</sup>. A list of the high temperature records can be viewed in the “Storms and Record Events” section later in this bulletin.

NDAWN’s highest recorded daily air temperature for December was 56.1 °F at Sidney MT on the 28<sup>th</sup>. The lowest recorded daily air temperature was -13.7 °F at Hofflund on the 5<sup>th</sup>.

## **January 2012**

The state average precipitation was 0.31 inches which is below the 1981-2010 normal state average of 0.49 inches. January 2012 state average precipitation ranked the 39<sup>th</sup> driest in the past 118 years with a maximum of 1.35 inches in 1916 and a minimum of 0.07 inches in 1973.

The High Plains Regional Climate Center (HPRCC) January percent of normal precipitation was less than 90% for most of North Dakota. Precipitation fell in the east on the 1<sup>st</sup>. The 2<sup>nd</sup> through the 10<sup>th</sup> was quiet with little to no precipitation across the state. There was on and off precipitation that fell throughout the remainder of the month. Based on the latest U.S. Drought Monitor published on January 24, 2012 eastern ND, encompassing nearly 12% of the state, was experiencing moderate drought.

The National Weather Service (NWS) reported breaking no precipitation records in January. See the “Storms and Record Events” section later in this publication for details on January precipitation records.

The US Drought Monitor February 14, 2012 report had abnormally dry conditions across the state and moderately dry conditions along the eastern edge and northeast corn.

The USDA, National Agricultural Statistics Service, North Dakota Field Office reported an average snow depth of 1.8 inches on January 29. Road conditions were rated 96% open, 4% difficult, 0% closed with 4% drifted, 12% icy, and 84% dry. (Weekly Weather and Crop Bulletin Vol. 99, No. 5).

According to the preliminary reports of the National Weather Service’s Storm Prediction Center (SPC), there were no severe weather reports of wind, hail or tornadoes in January.

The top five January daily maximum wind speeds recorded from NDAWN were 48.7 mph on the 1<sup>st</sup> at Robinson, 47.2 mph on the 3<sup>rd</sup> at Bowman, 47.2 mph on the 3<sup>rd</sup> at Linton, 45.8 mph on the 1<sup>st</sup> at Dazey and 45.8 mph on the 27<sup>th</sup> also at Dazey. NDAWN wind speeds are measured at a height of 10 feet (3 m).

The state average air temperature was 20.3 °F which is above the 1981-2010 normal of 10.53 °F. January 2012 state average air temperature ranked the 4<sup>th</sup> warmest in the past 118 years with a maximum of 25.9°F in 2006 and a minimum of -10.7°F in 1950.

NDAWN December average air temperatures ranged from 15 °F to 25 °F. NDAWN departure from normal temperatures were above normal across the state and ranged from 9 °F to 15 °F.

From the 3<sup>rd</sup> through the 10<sup>th</sup> average air temperatures were far above normal across the state. Temperatures dipped to near normal and below throughout the middle of the month. From the 22<sup>nd</sup> through to the end of the month temperatures were mostly near normal or above across the state. Based on the Applied Climate Information System (ACIS), Fargo area maximum air temperature for January ranked 4<sup>th</sup> warmest with 29.3 °F, Bismarck area tied 1908 for 6<sup>th</sup> warmest with 34.5 °F, and Williston area ranked 7<sup>th</sup> with 32.0 °F.

The National Weather Service (NWS) reported breaking multiple temperature records in the first part of January. Maximum temperature records were broken across the state on the 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup>, and 9<sup>th</sup>. See the “Storms and Record Events” section later in this publication for a complete list on January precipitation and temperature records.

NDAWN’s highest recorded daily air temperature for January was 64.6 °F at Hazen on the 5<sup>th</sup>. The lowest recorded daily air temperature was -28.3 °F at Bottineau on the 19<sup>th</sup>.

## **February 2012**

The state average precipitation was 0.45 inches which is equal to the 1981-2010 normal of 0.45 inches. February 2012 state average precipitation ranked 44th wettest in the past 118 years with a maximum of 1.83 inches in 1998 and a minimum of 0.06 inches in 1934.

The High Plains Regional Climate Center (HPRCC) February percent of normal precipitation was less than 50% for much of northern North Dakota with the driest region of less than 5% in the northeast, including parts of Towner, Benson, and Pierce Counties. Amounts of greater than 100% of normal precipitation fell in the far southern counties with the highest amounts of greater than 200% falling in the southeast, including parts of Richland, Sargent, and Cass Counties. According to the National Weather Service (NWS), the first half of the month was mostly dry with the last half of the month having four primary snowfall events. On the 15<sup>th</sup>, up to 3” of total snowfall fell in western ND. On the 20<sup>th</sup> through the 21<sup>st</sup>, 2” to 5” of snow fell in eastern ND. A highly variable snow storm on the 25<sup>th</sup> through the 27<sup>th</sup> had 2” to 8” of total snowfall. The higher amounts recorded from the 25<sup>th</sup>-27<sup>th</sup> snowstorm was Lidgerwood with 9” and Minot REC with 8.5”. The snow storm on the 29<sup>th</sup> hit hardest in the south central and southeast with totals between 4” and 7” of snow. According to the U.S. Drought Monitor published on February 28<sup>th</sup>, all of ND had at least abnormally dry conditions with the northeast corner having moderate drought conditions.

The National Weather Service (NWS) reported no precipitation records in February.

The US Drought Monitor February 28, 2012 report had abnormally dry conditions across the state and moderately dry conditions along the eastern edge and northeast corner.

The USDA, National Agricultural Statistics Service, North Dakota Field Office reported an average snow depth of 3.8 inches on February 26. Road conditions were rated 86% open, 13% difficult, 1% closed with 20% drifted, 17% icy, 2% muddy and 61% dry. (Weekly Weather and Crop Bulletin Vol. 99, No. 9).

According to the preliminary reports of the National Weather Service’s Storm Prediction Center (SPC), there were no severe weather reports of wind, hail or tornadoes in February.

The top five February daily maximum wind speeds recorded from NDAWN included Britton on the 26<sup>th</sup> with 52.6 mph, Linton on the 25<sup>th</sup> with 48.0 mph, Brorson MT on the 25<sup>th</sup> with 39.7

mph, Linton on the 26<sup>th</sup> with 39.0 mph and Turtle Lake on the 25<sup>th</sup> with 39.0 mph. NDAWN wind speeds are measured at a height of 10 feet (3 m).

The state average air temperature was 20.3 °F which is above the 1981-2010 normal of 15.62 °F. February 2012 state average air temperature ranked the 17<sup>th</sup> warmest in the past 118 years with a maximum of 29.7 °F in 1954 and a minimum of -14.1 °F in 1936.

NDAWN February monthly average air temperatures ranged from 14 °F to 23 °F. NDAWN departure from normal temperatures were above normal across most of the state and ranged from 0 °F to 9 °F. Daily average air temperatures were below normal on the 10<sup>th</sup> through the 12<sup>th</sup> and the 24<sup>th</sup> through the 28<sup>th</sup>. Otherwise, daily average air temperatures were primarily above normal. The average air temperature for the winter of 2011-2012 (Dec.-Feb.) ranked in the top 10 warmest on record at several locations. According to the Applied Climate Information System (ACIS), Fargo area had the warmest winter average air temperature on record with 22.1 °F. Grand Forks area ranked the 2<sup>nd</sup> warmest average air temperature with 19.2 °F. Bismarck area was 7<sup>th</sup> warmest with 23.4 °F. Williston area was 4<sup>th</sup> warmest with an average air temperature of 22.1 °F.

The National Weather Service (NWS) reported breaking no temperature records in February.

NDAWN's highest recorded daily air temperature for February was 54.5 °F at Hazen on the 5<sup>th</sup>. The lowest recorded daily air temperature was -19.6 °F at Harvey on the 27<sup>th</sup>.

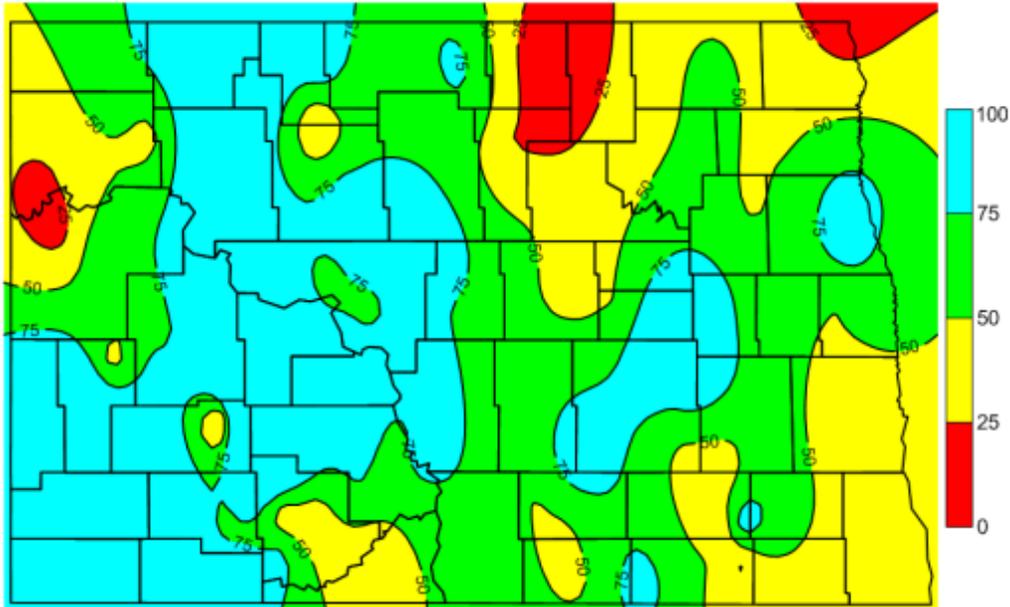
# Season in Graphics

## Winter 2011-2012 Weather in North Dakota:

Total Precipitation percent of mean (1981-2010)

Precipitation Percent of Normal

(Data from NWS Cooperative Network)

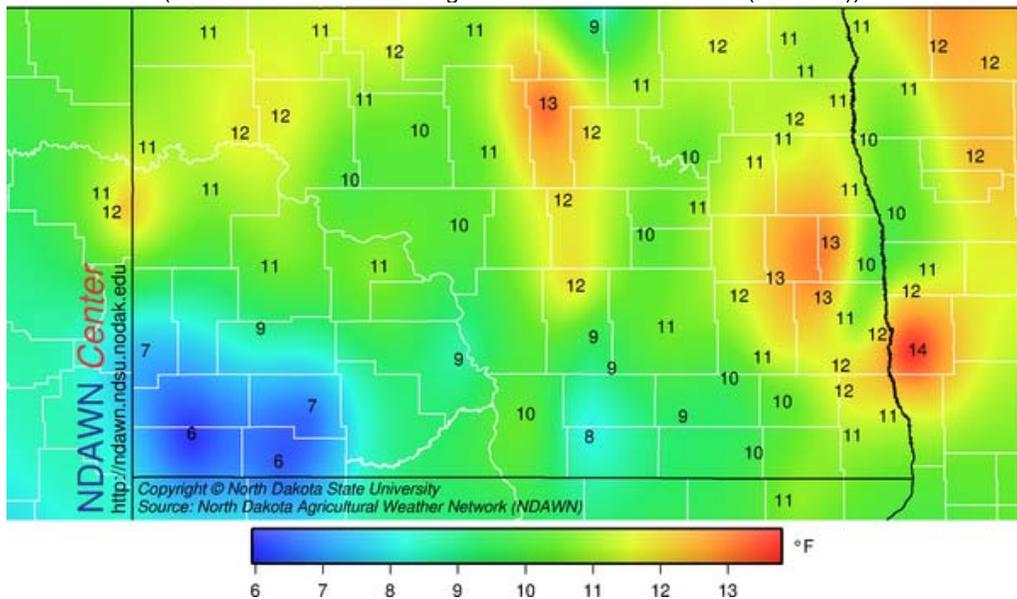


North Dakota State Climate Office

Average Temperature (°F) Deviation from Mean (1971-2000)

Departure From Normal Monthly  
Average Air Temperature in degrees F

(Data from North Dakota Agricultural Weather Network (NDAWN))



North Dakota State Climate Office

December 2011

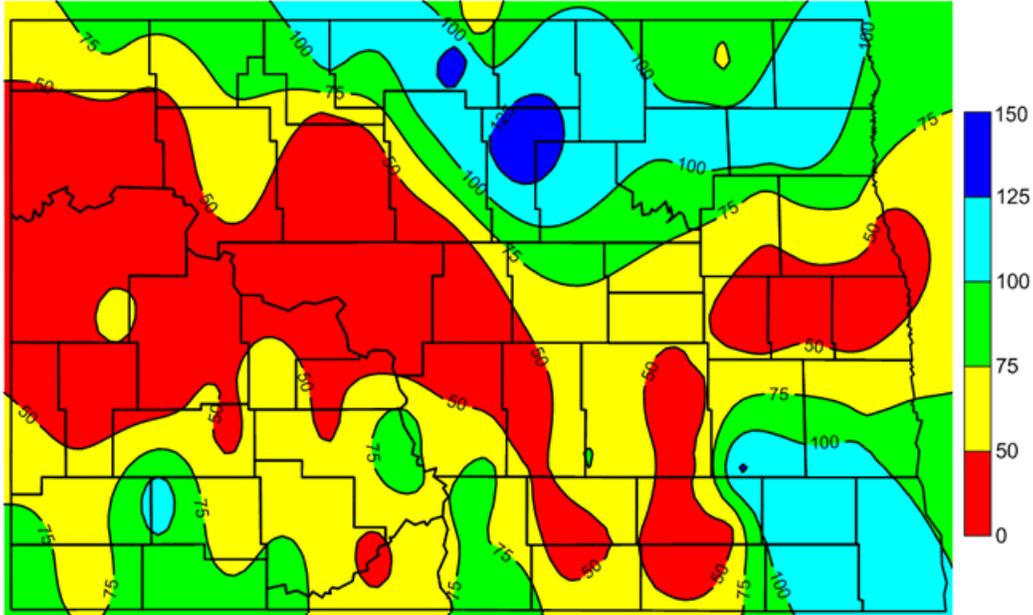
# Season in Graphics

## Winter 2011-2012 Weather in North Dakota:

Total Precipitation percent of mean (1981-2010)

Precipitation Percent of Normal

(Data from NWS Cooperative Network)



North Dakota State Climate Office

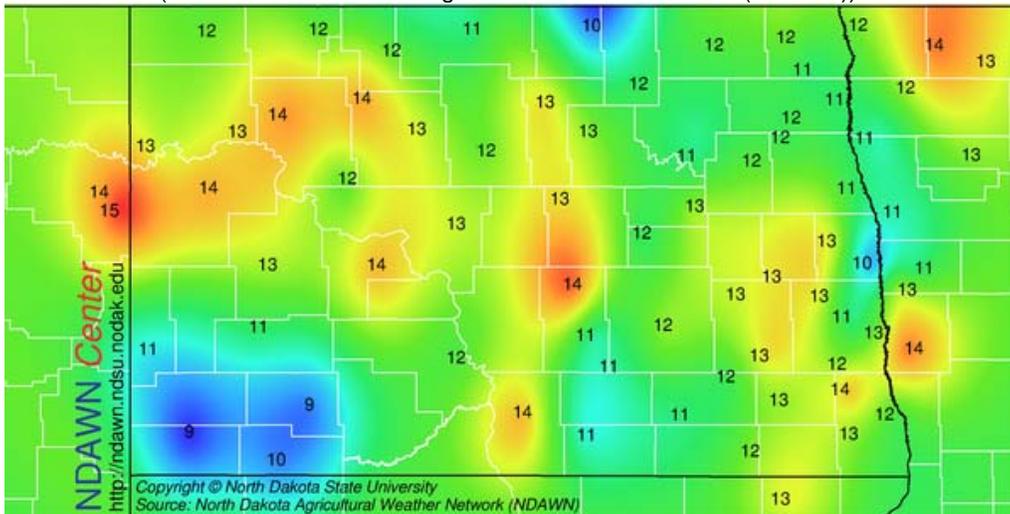
January 2012

Average Temperature (°F) Deviation from Mean (1971-2000)

Departure From Normal Monthly

Average Air Temperature in degrees F

(Data from North Dakota Agricultural Weather Network (NDAWN))



NDAWN Center  
http://ndawn.ndsu.nodak.edu

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Source: North Dakota Agricultural Weather Network (NDAWN)



North Dakota State Climate Office

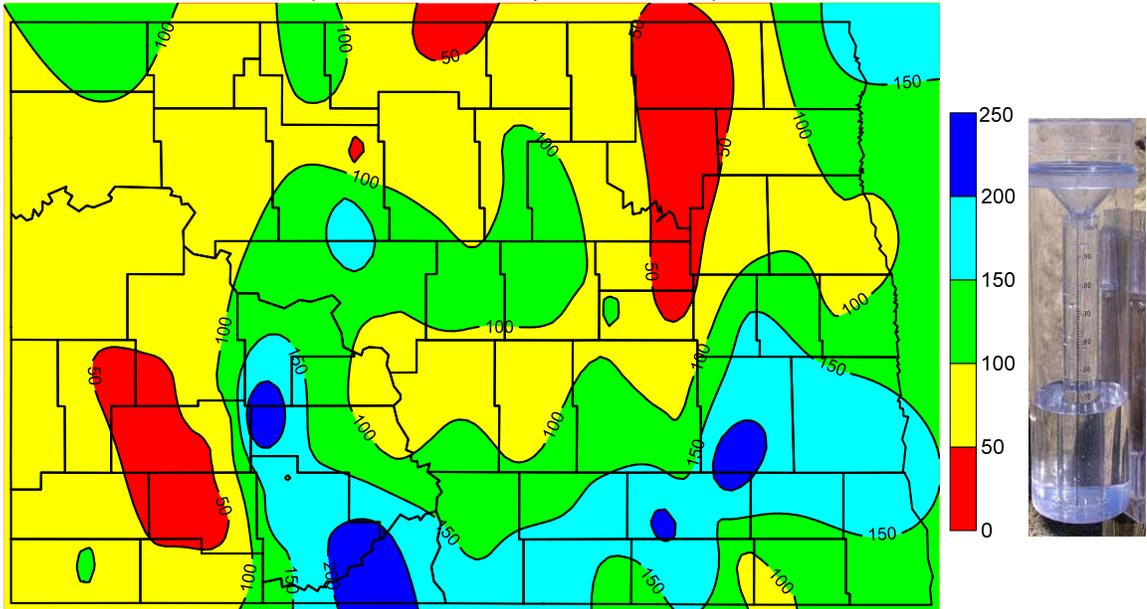
# Season in Graphics

## Winter 2011-2012 Weather in North Dakota:

Total Precipitation percent of mean (1981-2010)

Precipitation Percent of Normal

(Data from NWS Cooperative Network)



North Dakota State Climate Office

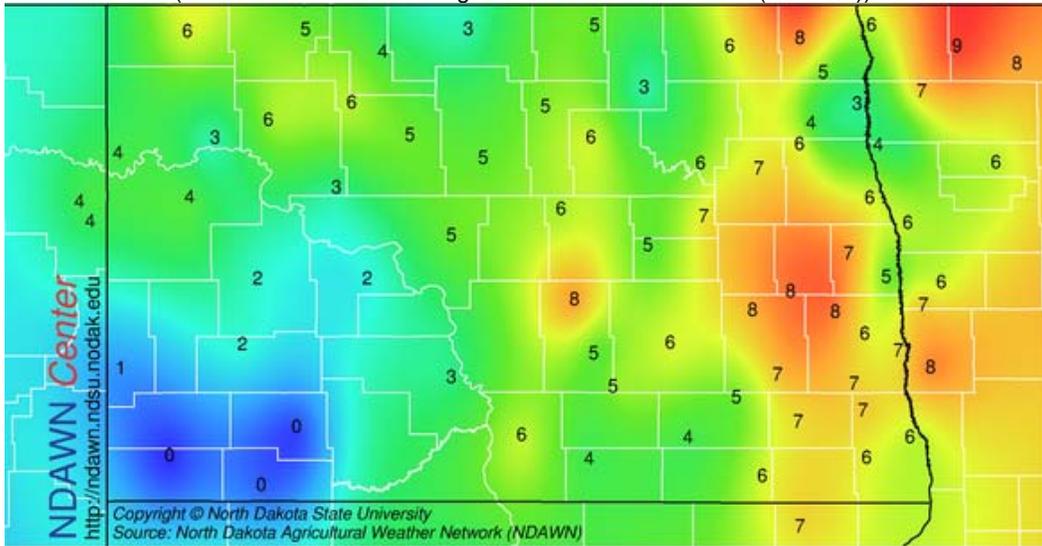
February 2012

Average Temperature (°F) Deviation from Mean (1971-2000)

Departure From Normal Monthly

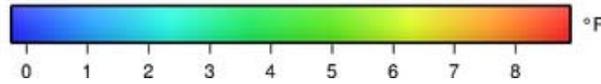
Average Air Temperature in degrees F

(Data from North Dakota Agricultural Weather Network (NDAWN))



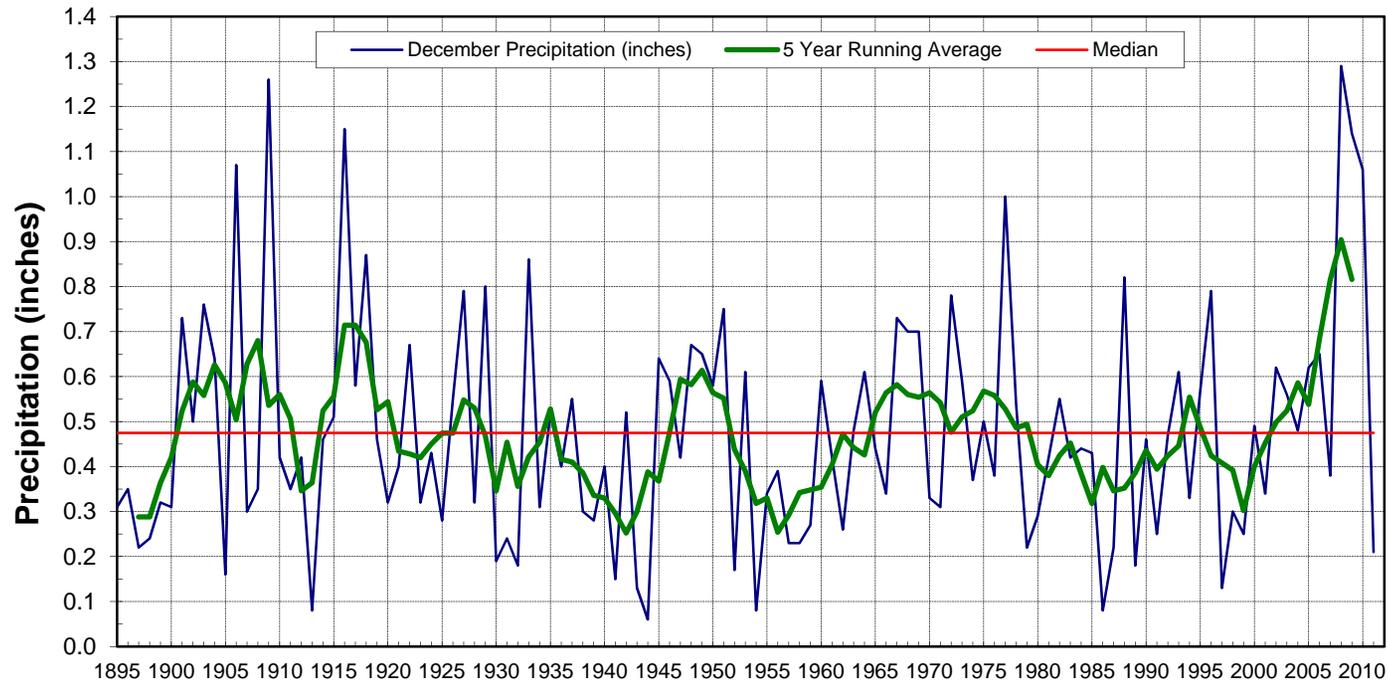
NDAWN Center  
http://ndawn.ndsu.nodak.edu

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Source: North Dakota Agricultural Weather Network (NDAWN)



North Dakota State Climate Office

# Historical December Precipitation for North Dakota



## December Precipitation Statistics

2011 Amount: **0.21 inches**

Maximum: 1.29 inches in 2008

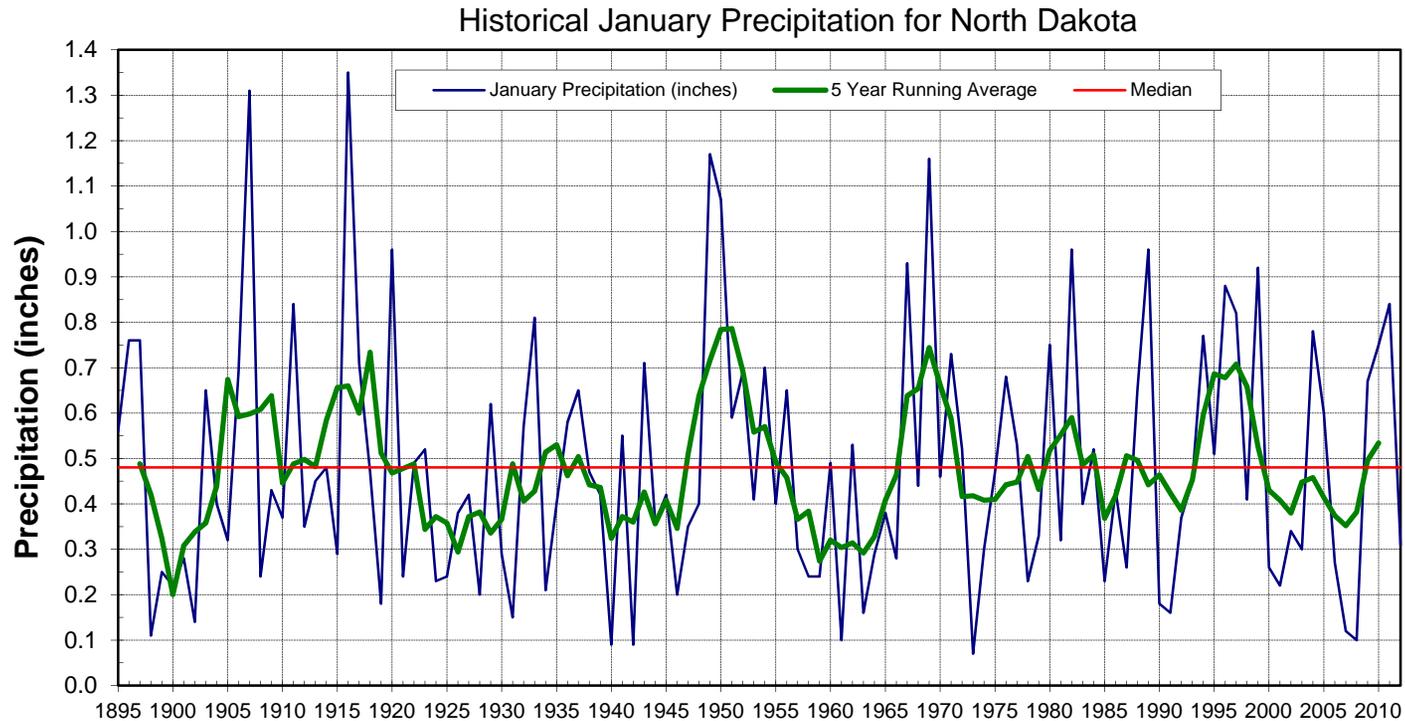
State Normal: 0.52" (1981-2010)

Monthly Ranking: 13<sup>th</sup> driest in 117 years

Minimum: 0.06 inches in 1944

Years in Record: 117

# Historical January Precipitation for North Dakota

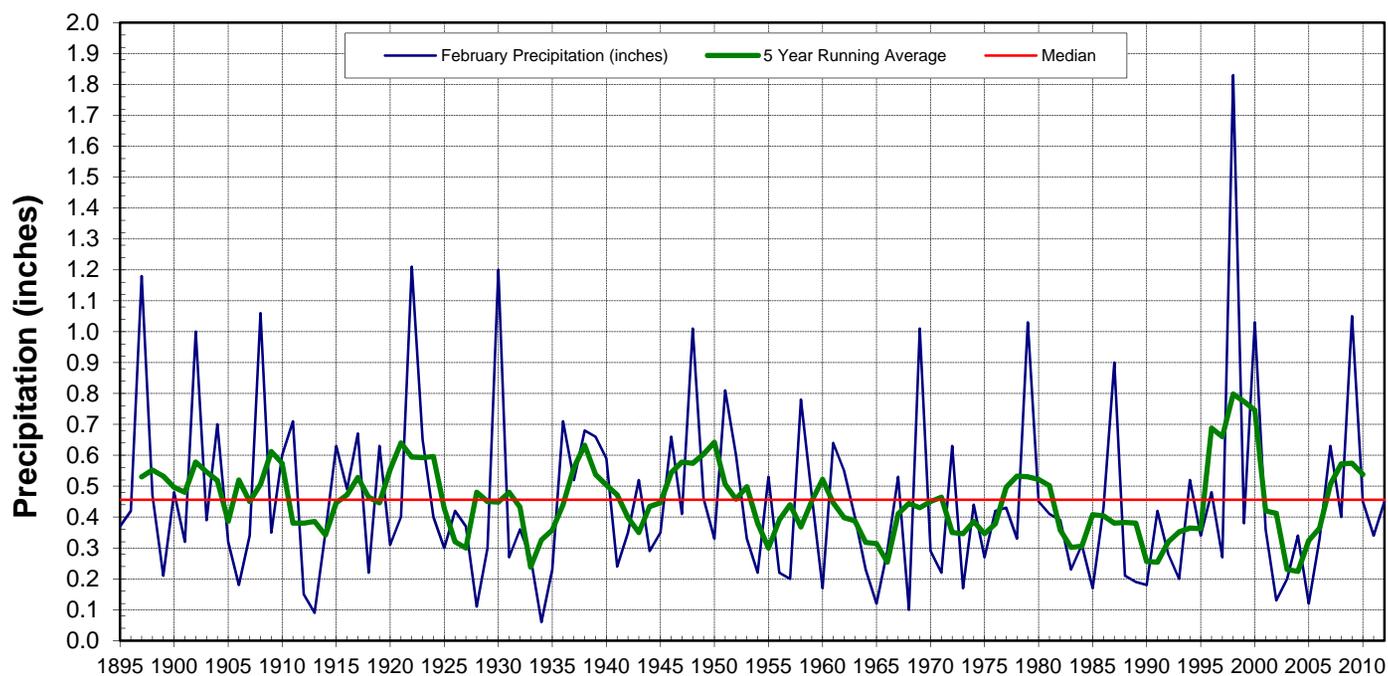


## January Precipitation Statistics

2012 Amount: 0.31 inches  
Maximum: 1.35 inches in 1916  
State Normal: 0.49" (1981-2010)

Monthly Ranking: 39<sup>th</sup> Driest in 118 years  
Minimum: 0.07 inches in 1973  
Years in Record: 118

# Historical February Precipitation for North Dakota

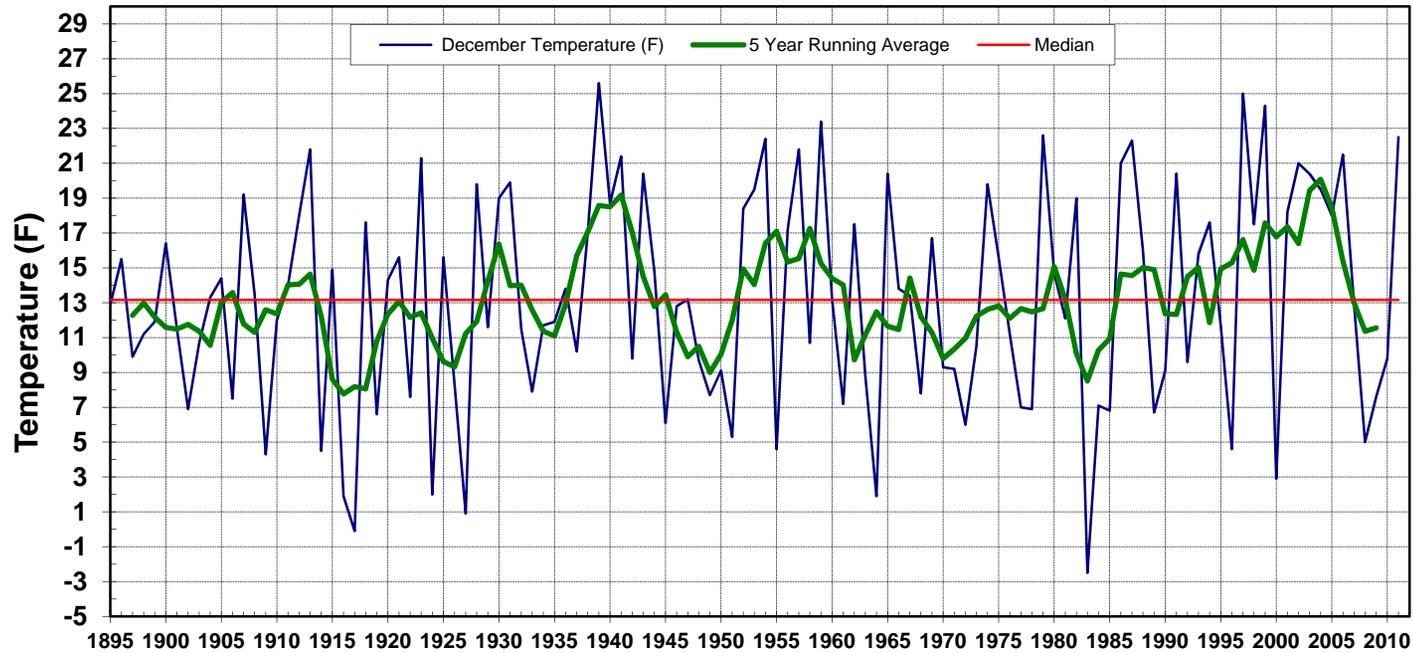


## February Precipitation Statistics

2012 Amount: 0.45 inches  
Maximum: 1.83 inches in 1998  
State Normal: 0.45" (1981-2010)

Monthly Ranking: 44<sup>th</sup> Wettest in 118 years  
Minimum: 0.06 inches in 1934  
Years in Record: 118

# Historical December Temperature for North Dakota

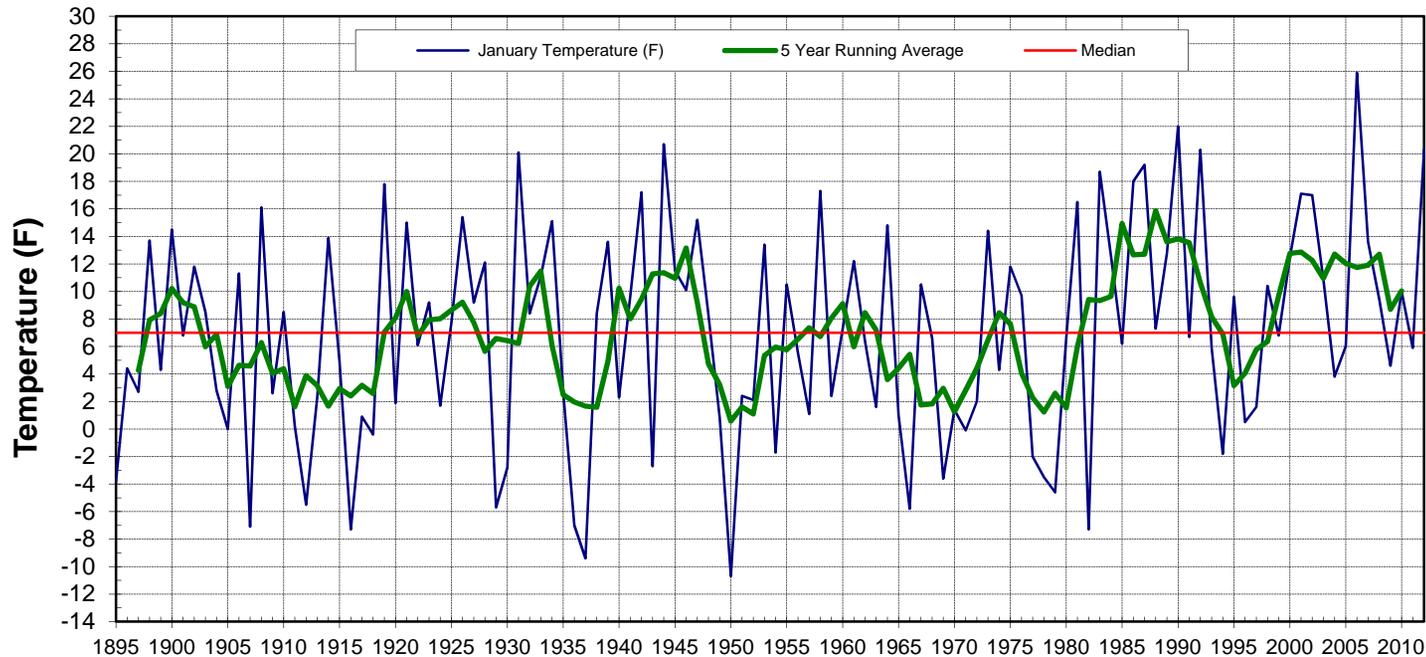


## December Temperature Statistics

2011 Average: 22.5 °F  
Maximum: 25.6 °F in 1939  
State Normal: 14.02 °F (1981-2010)

Monthly Ranking: 6<sup>th</sup> Warmest in 117 years  
Minimum: -2.5 ° F in 1983  
Years in Record: 117

# Historical January Temperature for North Dakota

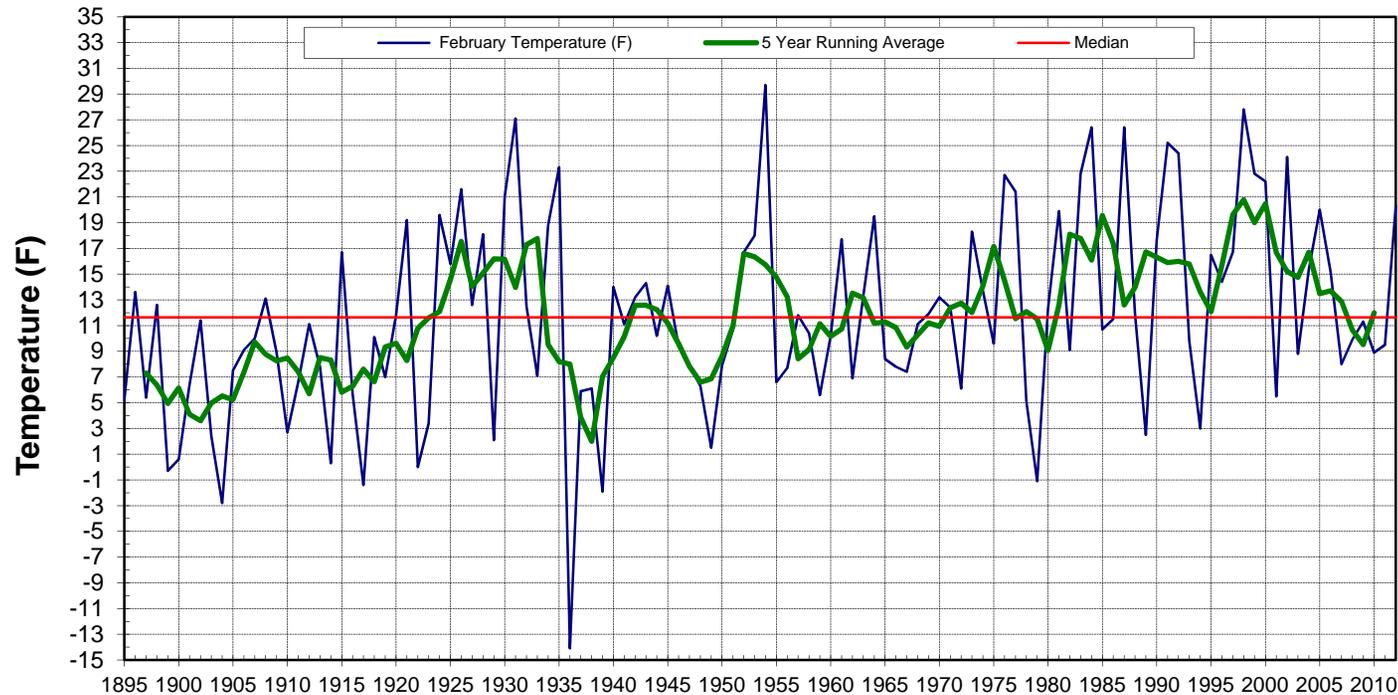


## January Temperature Statistics

2012 Average: 20.3 °F  
Maximum: 25.9 °F in 2006  
State Normal: 10.53 °F (1981-2010)

Monthly Ranking: 4<sup>th</sup> Warmest in 118 years  
Minimum: -10.7 °F in 1950  
Years in Record: 118

# Historical February Temperature for North Dakota



## February Temperature Statistics

2012 Average: **20.3 °F**  
Maximum: 29.7 °F in 1954  
State Normal: 15.62 °F (1981-2010)

Monthly Ranking: 17<sup>th</sup> Warmest in 118 years  
Minimum: -14.1 °F in 1936  
Years in Record: 118



# Storms & Record Events



## State Tornado, Hail, and Wind Reports for Winter 2011-2012 by B. A. Mullins

<b>North Dakota 3 Month Total</b>	<b>Wind</b>	<b>Hail</b>	<b>Tornado</b>
	<b>0</b>	<b>0</b>	<b>0</b>

Reports by Month	Wind	Hail	Tornado
<b>Month</b>	<b>Wind</b>	<b>Hail</b>	<b>Tornado</b>
<b>Total December</b>	0	0	0
<b>Total January</b>	0	0	0
<b>Total February</b>	0	0	0

## North Dakota Record Event Reports for Winter 2011-2012

Date	Location	Type of Record	Previous Record
12/18/11	Bismarck	High temperature of 56 °F	Ties 1979
12/18/11	Jamestown	High temperature of 54 °F	51 °F set in 1939
12/18/11	Grand Forks NWS	High temperature of 50 °F	46 °F set in 1943
12/18/11	Grand Forks airport	High temperature of 55 °F	50 °F set in 1923
12/18/11	Fargo	High temperature of 51 °F	44 °F set in 1943
12/19/11	Jamestown	High temperature of 48 °F	Ties 2005
12/26/11	Grand Forks NWS	High temperature of 49 °F	42 °F set in 1994
12/26/11	Grand Forks airport	High temperature of 49 °F	42 °F set in 2006
12/26/11	Fargo	High temperature of 52 °F	45 °F set in 1959
12/26/11	Jamestown	High temperature of 48 °F	Ties 2005
12/28/11	Dickinson	High temperature of 54 °F	52 °F set in 1999
01/03/12	Grand Forks airport	High temperature of 41 °F	Ties 2007
01/03/12	Bismarck	High temperature of 55 °F	49 °F set in 1962
01/03/12	Williston	High temperature of 49 °F	45 °F set in 1962
01/03/12	Minot	High temperature of 47 °F	46 °F set in 2007
01/03/12	Dickinson	High temperature of 53 °F	Ties 1962
01/04/12	Fargo	High temperature of 41 °F	Ties 2001
01/04/12	Bismarck	High temperature of 55 °F	44 °F set in 2001
01/04/12	Williston	High temperature of 50 °F	48 °F set in 2008
01/04/12	Jamestown	High temperature of 46 °F	42 °F set in 2001
01/05/12	Fargo	High temperature of 55 °F	40 °F set in 1984
01/05/12	Grand Forks NWS	High temperature of 47 °F	42 °F set in 1984
01/05/12	Grand Forks airport	High temperature of 46 °F	42 °F set in 1984
01/05/12	Williston	High temperature of 58 °F	50 °F set in 1914
01/05/12	Dickinson	High temperature of 62 °F	53 °F set in 2008
01/05/12	Minot	High temperature of 61 °F	50 °F set in 1914
01/06/12	Fargo	High temperature of 44 °F	42 °F set in 1928
01/09/12	Fargo	High temperature of 51 °F	49 °F set in 1958
01/09/12	Bismarck	High temperature of 53 °F	52 °F set in 1933
01/09/12	Dickinson	High temperature of 54 °F	53 °F set in 1953
01/09/12	Williston	High temperature of 51 °F	49 °F set in 1933

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<b>01/09/12</b>	Minot	High temperature of 50 °F	47 °F set in 1928
<b>01/09/12</b>	Jamestown	High temperature of 52 °F	46 °F set in 1958
<b>01/10/12</b>	Fargo	High temperature of 51 °F	47 °F set in 1990
<b>01/30/12</b>	Williston	High temperature of 51 °F	50 °F set in 1931

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# Seasonal Outlook



## Spring 2012 Climate Outlooks

by D. Ritchison<sup>1</sup>

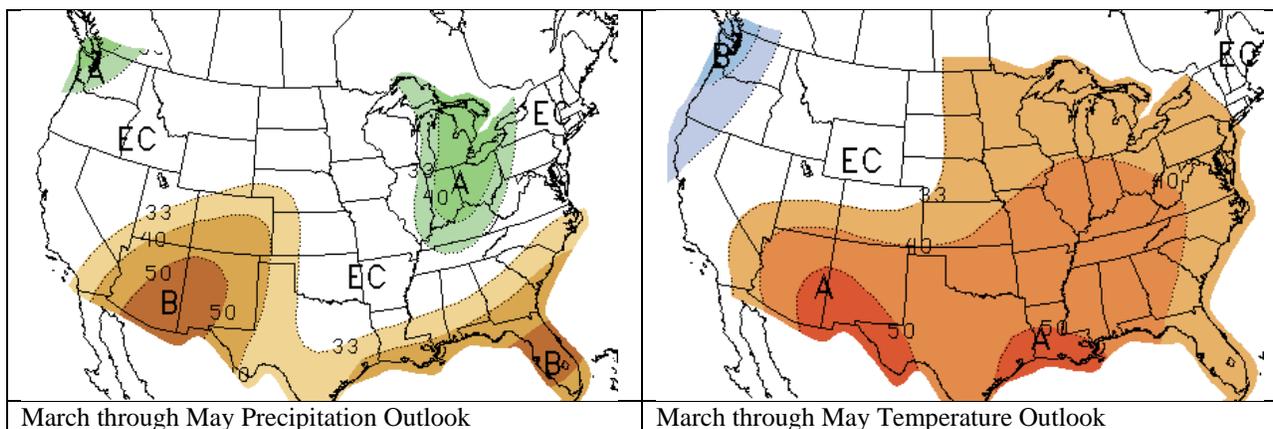
North Dakota has recorded a phenomenal stretch of above average temperatures for the past several months. This warmth has not only been experienced locally, but across much of the lower 48 states. Yet, it should be noted that the rest of the Northern Hemisphere has not been so fortunate. In fact, much of Europe and Asia has observed below average temperatures during this same time frame.

Spring and autumns are always the most difficult to forecast because of large swings that can and do occur on both daily and weekly time scales. Plus, with so much cold elsewhere on the planet, this spring in particular has the potential for giant swings from warm to cold. These temperature swings can also lead to prolong periods of dry weather intermixed with brief periods of significant precipitation.

Using that as a backdrop, after a mild March that may end up as one of the warmest on record for the region, April looks to be transitioning to colder weather, followed by a near average May. That would mean, overall, an above average temperature for the season, but we always need to remember, that does not mean consistently above average and a poorly timed cold front can easily hamper the planting season.

Although historically when a La Niña is present in the Pacific, this area has a higher than normal likelihood of recording above average precipitation in the spring, the current La Niña is fading quickly and therefore, the odds favor this season to finish nearer to the long-term average for rain and late season snowfall. If that forecast holds, it would be a welcome change from the excessive spring moisture many areas have recorded in recent years.

The latest spring outlook from the Climate Prediction Center (CPC) for the next three months can be seen below. The CPC is forecasting a slightly higher than normal probability of above average temperatures and equal changes of above, below or normal precipitation. You can find the current and future outlooks, when new ones become available, at <http://www.cpc.ncep.noaa.gov/products/predictions/90day>.



Also, the North Dakota State Climate Office has links to the National Weather Service's local 3-month temperature outlooks for the upcoming year. Those forecasts can be found at: <http://www.ndsu.edu/ndSCO/outlook/L3MTO.html>. The readers will also find the following National Weather Service office web sites very useful for shorter term weather forecasts:

Eastern North Dakota: <http://www.crh.noaa.gov/fgf/>  
Western North Dakota: <http://www.crh.noaa.gov/bis/>

<sup>1</sup> The corresponding author: Daryl Ritchison is a broadcast meteorologist working at WDAY-TV Fargo, ND.  
E-Mail: [daryl@ritchison.com](mailto:daryl@ritchison.com)



# Hydro-Talk

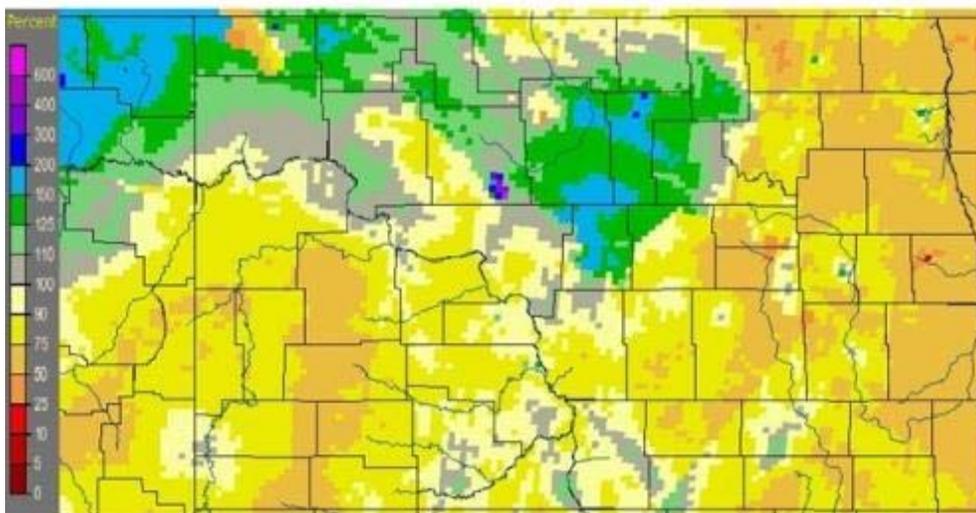


## Pendulum Swing of Hydrological Extremes in ND

by A. Schlag<sup>2</sup>

Wow, what a difference a year makes. As far as that goes, how about the difference seen over just the past six or seven months? Despite a lack of fanfare due to the time of year, and the previous wet nine months, the majority of North Dakota has been abnormally dry since the middle of August, 2011. As shown below from the NWS' precipitation mapping service, only a select part of the northwest and north central part of the state have been normal to above normal in moisture since last August.

Bismarck, ND (BIS): Current 180-Day Percent of Normal Precipitation  
Valid at 3/12/2012 1200 UTC - Created 3/12/12 18:23 UTC



What the above has created were near perfect fall harvest conditions for those farmers lucky enough to not have suffered significant prevent plant earlier from flooding. Similarly, the warm and dry fall had many areas of the state experiencing active vegetative growth well past normal since the first widespread killing frost didn't happen until late October. Despite the warm and dry weather there

were no serious side effects to local rivers and wetlands because of strong baseflow from groundwater into the surface waters. In fact, groundwater flow into the rivers kept most were well above seasonal norms deep into winter and eventual ice cover conditions.

The winter of 2011-2012 has defied the odds of a typical La Niña winter by being warmer and dryer than normal, largely due to the effects of a predominantly positive Arctic Oscillation. While a reprieve from the past few years of historic flooding is welcome, the tendency of North Dakota to be a climate of extremes has seen the pendulum swing, and swing hard, into the realm of drought. The only thing that has kept this drought from being classified as even stronger than the current widespread D0 (abnormally dry) designation of the University of Nebraska – Lincoln's Drought Monitor is the lack of negative effects to the area.

Regrettably, the past few wet years have built up a significant fuel base for fires that is still standing across most of North Dakota. As the State progresses farther into spring, snow, rain, SOMETHING, will become increasingly needed to green the prairie and stem the fires that have already started to pop up on warm and windy afternoons. That being said, it is hard to believe with the current weather pattern that the calendar is showing us to still be early in March. This suggests that we still have over half of March, April, and most of May left before we are safely out of the timeframe that brought widespread rains which overwhelmed the Souris and Missouri rivers. Clearly the risk of spring flooding continues to diminish with each passing day, but last year was a brutal reminder of just how devastating spring rains can be in North Dakota. Hopefully, the next few months will see a moderation of that pendulum and we won't be reminded of the also terrible effects of a widespread drought during the summer.

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# Science Bits



## New USDA Plant Hardiness Zone Map

by F. A. Akyüz<sup>3</sup>

Year	Lowest Annual Temperature (°F)
1976	-29
1977	-35
1978	-24
1979	-30
1980	-26
1981	-21
1982	-30
1983	-31
1984	-31
1985	-26
1986	-24
1987	-22
1988	-21
1989	-33
1990	-27
1991	-19
1992	-23
1993	-24
1994	-33
1995	-16
1996	-39
1997	-30
1998	-21
1999	-23
2000	-22
2001	-24
2002	-12
2003	-21
2004	-36
2005	-28
<b>Average</b>	<b>-26</b>
<b>Warmest</b>	<b>-12</b>
<b>Coldest</b>	<b>-39</b>

Earlier this year, USDA announced a change in the plant hardiness zone map. The old map has been widely used by horticulturalists, master gardeners, plant scientists and many more industries whose main concern is to see what type of plants they can grow in their respective regions. The new map comes with added functionalities compared to the old one. First of all, the states on the map are clickable in order to view the map at state level. In addition to clickable navigation, a zip code function allows users to get the most specific hardiness zone category for where they live. For example, I typed 58104 to find out what hardiness zone Fargo, ND would fall into. I found out that Fargo, ND falls into zone 4-A. Based on the USDA web site it means that the annual minimum winter temperature in Fargo must be between -30° and -25°F; however, it is incorrect. The numbers actually represent the mean lowest annual temperature. Data is tabulated based on the 30 years of historical data from 1976 to 2005. In fact, during this period, Fargo’s lowest annual temperatures ranged from -39°F (in 1996) to -12°F (in 2002) with the average of -26 (the table on the left).

Consider this: if you live in Fargo, ND you would make sure to select your plants that would grow in zone 4-A (at least -25° hardy). Now let’s see how frequent -25° was during the last century from 1881 to 2011. The graphic in Figure 1 on the next page shows the annual frequency of daily temperatures in Fargo hitting the -25° mark. It suggests that even though Fargo, on the average, experiences 5 lesser days of -25° (or colder) in most recent years compared to 100 years ago, Fargo will still have some chance of experiencing -25° in a given year. Now let’s calculate what that chance is. Figure 2 is an attempt to calculate the probability of having -25° (or colder) in a given year. It suggests that probability of having at least one -25° (or colder) day per year during the last decade ending in 2011 is 70%. Actually, 70% is the risk of meeting that threshold. It is a high risk for horticulturalists and master gardeners who cannot afford losing their perennial plants.

I hope this brings some perspective for interpreting the USDA’s plant hardiness map. The map can be accessed on the following web site: <http://planthardiness.ars.usda.gov/>

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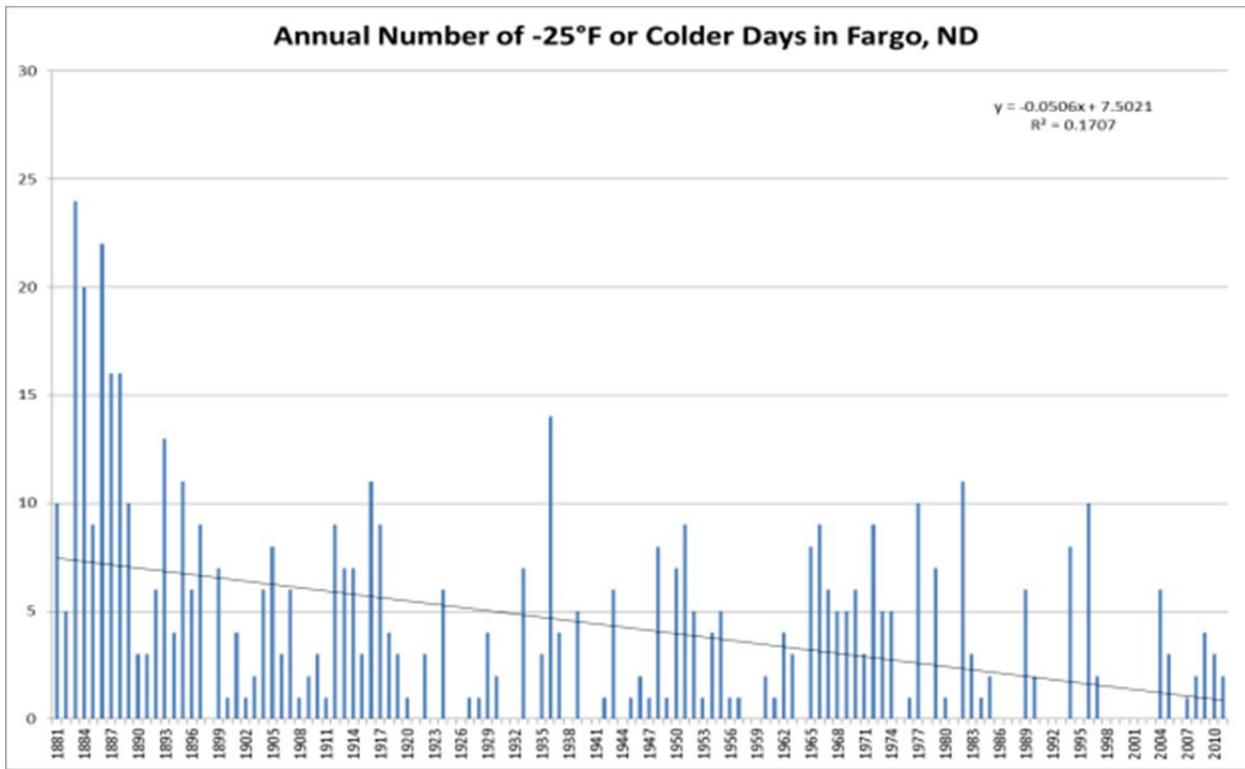


Figure 1. Annual number of -25° (or colder) days in Fargo, ND

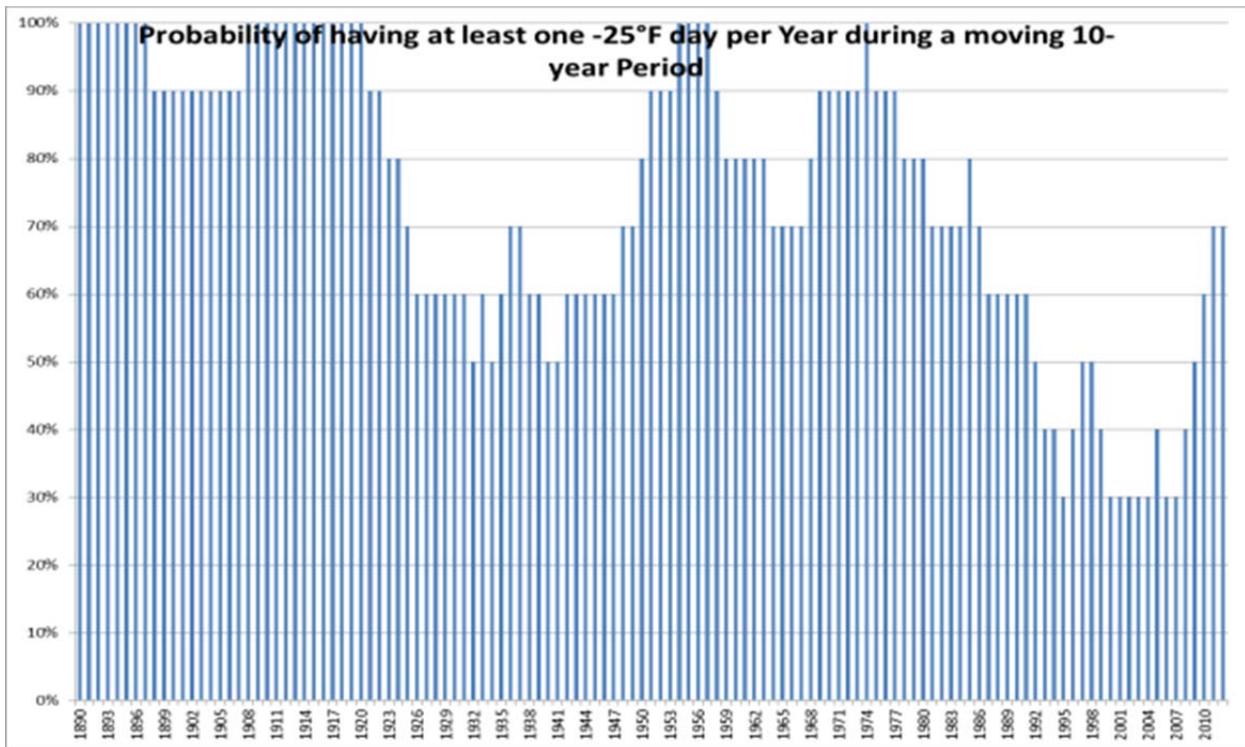


Figure 2. Probability of having at least one -25° (or colder) day per year during a 10-year period ending with the year shown on the x-axis in Fargo, ND.

# CONTACTING THE NORTH DAKOTA STATE CLIMATE OFFICE

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Please contact us if you have any inquiries, comments, or would like to know how to contribute to this [quarterly bulletin](#).

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