

Minnesota WeatherTalk Newsletter for Friday, January 7th, 2011

To: MPR Morning Edition Crew
From: Mark Seeley, University of Minnesota Extension
Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, January 7th, 2011

Headlines:

- Cold continues
- Overlooked feature of 2010 weather
- Experimental Extreme Cold Warning
- Weekly Weather Potpourri
- MPR listener question
- Almanac for January 7th
- Past weather features
- Feeding storms
- Outlook

Topic: Cold continues to start 2011

Following a colder than normal December, January is continuing the pattern as mean temperatures are averaging 5 to 9 degrees F colder than normal through the first week of the month. Minnesota has reported the coldest temperature in the 48 contiguous states four times so far this month, the coldest being -33 degrees F at Bigfork on the 3rd. In fact several places including Bemidji, International Falls, Bigfork, Babbitt, and Cass Lake have recorded -30 degrees F or colder already this month. Temperatures

are expected to continue colder than normal well into the third week of the month, with perhaps some moderation in temperature and a January thaw during the last ten days of the month.

Topic: Overlooked feature of 2010 weather

In my write-up and radio comments of last week about significant weather in 2010 several people mentioned that I overlooked the flash flood event in southern Minnesota over September 22-23, 2010 affecting at least 19 counties. One of the largest flash floods in history, this storm produced rainfall amounts greater than 10 inches in some places (11.06 inches near Winnebago) and near record flood crests on many Minnesota watersheds. Indeed several roads and highways were flooded and closed. You can read more about this weather event from 2010 at...

http://climate.umn.edu/doc/journal/flash_floods/ff100924.htm

Topic: Experimental Extreme Cold Warning

Several regional National Weather Service Offices, including Minneapolis and Duluth are participating in the trial use of an Extreme Cold Warning. This warning is triggered by expected low temperatures of -20 to -25 degrees F or colder. In the absence of very cold temperatures coupled with any significant wind which would normally lead to wind chill advisories and warnings, this warning will be issued to the public based on actual air temperatures that fall to dangerous levels. Other NWS offices in North and South Dakota will be using this warning as well. Its usefulness will be evaluated after the winter season.

Weekly Weather Potpourri:

More heavy snow was falling in Scotland this week, closing schools in some areas. According to the United Kingdom Meteorological Office December of 2010 was the coldest in the country since comprehensive records began in 1910. The month was dominated by cold, near record-setting temperatures and snow. Only five months in history have been colder than December 2010 in the United Kingdom: January 1940, February 1947, January 1963, February 1963, and February 1986. You can read more about this at.....

<http://www.metoffice.gov.uk/news/releases/archive/2011/cold-dec>

For Australia, 2010 was the 3rd wettest year in history and the especially heavy doses of rainfall in November and December produced widespread flooding there, especially throughout Queensland. Many areas received 15-20 inches of rainfall in

December alone. Several rivers were well above flood stage and with showers in the forecast for this week they were expected to stay that way well into the new year.

Portions of northern India have been in the grip of a cold wave this week with several deaths from exposure reported. Temperatures in Delhi fell as low as 39 degrees F, coldest of the winter so far. In parts of Kashmir temperatures were as cold as -10 degrees F for two days.

MPR Listener Question: How did the 2010 mean temperature and total precipitation rank relative to state history? Did some record their wettest year in history?

Answer: According to the Minnesota State Climatology Office preliminary climate data for 2010 indicate that it was the 9th warmest year on a statewide basis, but the 2nd wettest (trailing only 1977). The statewide average precipitation for 2010 was 33.44 inches. Indeed some observers did report their wettest year in history. These included: Wabasha with 49.92 inches, Caledonia with 49.01 inches, La Crescent with 48.07 inches, Hutchinson 41.71 inches, Marshall 43.86 inches, Pipestone 39.02 inches, Winnebago 44.53 inches, Amboy 44.08 inches, and Mora 41.71 inches. You can read more about the 2010 climate summary at the Minnesota Climatology Working Group web site....

http://www.climate.umn.edu/doc/journal/warm_wet_2010.htm

Almanac for January 7th:

The average MSP high temperature for this date is 21 degrees F (plus or minus 13 degrees standard deviation), while the average low is 5 degrees F (plus or minus 15 degrees standard deviation).

MSP Local Records for January 7th:

MSP weather records for this date include: highest daily maximum temperature of 52 degrees F in 2003; lowest daily maximum temperature of -11 degrees F in 1887; lowest daily minimum temperature of -34 degrees F in 1887; highest daily minimum temperature of 34 degrees F in 1965; record precipitation of 0.30 inches in 1989; record snowfall of 3.6 inches in 1989.

Average dew point for January 7th is 5 degrees F, with a maximum of 37 degrees F in 1965 and a minimum of -33 degrees F in 1976.

All-time state records for January 7th:

Scanning the state climatic data base: the all-time high for this date is 59 degrees F at New Ulm (Brown County) in 1933 and at Amboy (Blue Earth County) in 2003; the all-time low is -54 degrees F at International Falls (Koochiching County) in 1909. The all-time record precipitation amount for this date is 2.50 inches at Hutchinson (McLeod County) in 1999. The state record daily snowfall for this date is 36.0 inches at Wolf Ridge Environmental Learning Center near Finland (Lake County) in 1994.

Past Weather Features:

January 7, 1873 began as a mild day with temperatures near 32 degrees F. But a massive winter storm brought blizzard conditions to the state by late in the day. The blizzard raged for most of 3 days, dropping temperatures into the -20 F and bringing several inches of snowfall. Over 70 deaths were reported, many livestock were lost, and the railroads were paralyzed for days due to high drifts.

On January 7, 1909 northern Minnesota residents were caught in the midst of an arctic cold wave. Over 20 communities reported temperatures of -30 degrees F or colder. At International Falls the temperature remained below zero F from midday on the 4th to midday on January 13, a period of 216 consecutive hours. During that time the thermometer read -50 degrees F or colder on three days and climbed no higher than -29 degrees F on January 6.

January 7-9, 1969 brought a blizzard to central and northern Minnesota communities. Even though snowfall amounts ranged from 5 to 10 inches, winds up to 50 mph piled huge drifts across roads and highways, causing many closures. Most schools were closed for at least two days.

January 6-8, 1989 brought a blizzard to Red River Valley communities in Minnesota. Many observers reported over a foot of snowfall (17 to 18 inches at Detroit Lakes and Fergus Falls) driven by winds of 35 to 50 mph. Both Interstates 94 and 29 were closed for a period of time. The abundant snowfall that melt helped contribute to flooding on the Red River later that spring.

Record-setting snowfall occurred over the north shore (Lake Superior) region of Minnesota on January 6-7, 1994. Duluth reported 24.5 inches and Two Harbors reported 18 inches of snowfall. At Wolf Ridge Environmental Learning Center near Finland snowfall of 45 inches was measured over the two days, an incredible 36 inches coming on the 7th. Snow depth there was 49 inches, meaning snowshoes were mandatory to walk around outside. They reported a record 59.6 inches of snowfall in January of 1994.

Words of the Week: Feeding storms

This terminology is not used in the USA but more in Scotland. It refers to a snow storm that simply adds to the snow already on the landscape. Thus after permanent snow cover is established early in the winter season, one could argue that all snow storms are "feeding storms", adding to the quantity of snow cover. Given the existing spring snow melt flood threat already present on many Minnesota watersheds, we hope that the rest of the winter brings fewer "feeding storms" to our state.

Outlook:

Cold and dry over the weekend, with increasing clouds late on Sunday and a chance for flurries. Chance of light snow for Monday and Tuesday and continued colder than normal conditions next week. Increasing chance for snow towards next weekend.

Further Information:

For older versions of the "Minnesota WeatherTalk" newsletter go to

<http://www.climate.umn.edu/weathertalk/>

For access to other information resources go to

<http://www.climate.umn.edu/Seeley/>

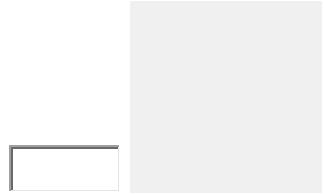
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Minnesota WeatherTalk Newsletter for Friday, January 14th, 2011

To: MPR Morning Edition Crew

From: Mark Seeley, University of Minnesota Extension

Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, January 14th, 2011

Headlines:

- Cold and snow a constant theme
- Kathy Erickson retirement
- Weekly Weather Potpourri
- MPR listener question
- Almanac for January 14th
- Past weather features
- Bogged
- Outlook

Topic: Cold and snow is a constant theme

Through the first two weeks of January, Minnesota has reported the lowest temperature in the 48 contiguous states on seven days. The colder than normal trend in temperatures established across the state in December has continued into January. Since the 1st of December daily temperatures have climbed to the freezing mark (32 F) only 4-5 times around the state and most observers have yet to see a temperature of 30 degrees F this month. In addition the majority of days this month have brought at least a trace of snowfall to many areas. MSP Airport in the Twin Cities has reported at

least a trace of snow on every day, except for January 12th. Earlier in the week over January 10-11 some significant snowfall amounts were reported from Pipestone with 10 inches, Fairmont with 9 inches, Schroeder (along the Superior north shore) with 9 inches, Worthington and Amboy with 8 inches, and Winnebago and Windom with 7 inches. Also earlier in the week the observer at Kabetogama reported a snow depth of 33 inches, the deepest snow there in over a decade. Colder and snowier than normal weather is expected to continue until near the end of the month.

Topic: Kathy Erickson retiring from the National Weather Service

After serving Minnesota citizens through the 1970s , 1980s, 1990s, and first decade of the 21st Century Kathy Erickson is retiring from the Twin Cities National Weather Service Forecast Office. We in the weather community wish her all the best. She was probably most widely known for her voice as for many years she was the voice of NOAA Weather Radio in our state, until the computer-based synthesized voice technology took over. Very best wishes to Kathy for a long and happy retirement and thanks for your public service.

Weekly Weather Potpourri:

This week has brought near-record cold to southeastern states and another heavy snow to northeastern states. At Tallahassee, FL where they just recorded their coldest December in history last month, they have already reported three mornings in the 20s F this week (28 degrees F on January 12th). Atlanta, GA has been as cold as 19 degrees F, and at one point this week the National Weather Service noted that 49 of 50 states reported some snow on the ground. Meanwhile in the northeastern states over two feet of new snow was reported by some observers, especially in CT, MA, and NH. Among the heavy snow reports: Savoy, MA reported 40.5 inches, Wilmington, VT reported 36 inches, Woodford, VT reported a fresh 35 inches of snowfall. Many schools and roads were closed, more at....

<http://forecast.weather.gov/product.php?site=NWS&issuedby=ALY&product=PNS>

Queensland, Australia was finally seeing flood waters recede this week, after devastating many large cities, including Brisbane. But continued light rainfalls were still in their forecast for much of the weekend and into next week. Through the first half of January Brisbane has recorded over 10.5 inches of rainfall, following a December that delivered nearly 19 inches of rainfall. This is the wettest period for them since 1974.

Parts of Brazil were also suffering from floods this week as some areas north of Rio de Janeiro reportedly have received the heaviest rainfall since 1967. Many observers

there have reported 4-8 inches of rainfall this week. Rivers ran over their banks and mudslides occurred in many places. The death toll was in the hundreds.

A report from a study done at Cornell University documents that the Earth's atmosphere is about twice as dusty now as it was in the 19th Century. The study links the atmospheric dust content to climate behaviors as well. You can read more at...

<http://www.sciencedaily.com/releases/2011/01/110110055748.htm>

NASA-GISS researchers reported earlier this week that the global mean temperature for 2010 tied (2005) for the warmest of the instrumental record. Despite fluctuations associated with El Nino/La Nina events, the upward temperature trend is expected to continue. You can read more at...

<http://www.sciencedaily.com/releases/2011/01/110113102154.htm>

MPR Listener Question: Can you tell me if the flooding in northern Australia is related to the current La Nina episode in the equatorial Pacific Ocean?

Answer: Yes, according to the Australian Bureau of Meteorology historical La Nina episodes have been correlated to large precipitation amounts in the northern parts of Australia, including the Northern Territory and Queensland. The so-called "Big Wet" or flooding that occurred in Queensland back in 1974 was related to a relatively strong episode of La Nina, where colder than normal waters prevail in the central and eastern equatorial Pacific Basin, but warmer than normal waters prevail near Australia. Australian researchers also suggest that this month's flooding may be partly attributable to above normal sea surface temperatures in the Indian Ocean Basin as well. This feature is tied to a feature called the Indian Dipole. You can read more about this at....

<http://www.jamstec.go.jp/frsgc/research/d1/iod/>

or

<http://www.climatecentral.org/blog/climate-change-connection-to-australian-flooding/>

Almanac for January 14th:

The average MSP high temperature for this date is 23 degrees F (plus or minus 14 degrees standard deviation), while the average low is 5 degrees F (plus or minus 14 degrees standard deviation).

MSP Local Records for January 14th:

MSP weather records for this date include: highest daily maximum temperature of 43 degrees F in 1914; lowest daily maximum temperature of -16 degrees F in 1972; lowest daily minimum temperature of -26 degrees F in 1963 and 1972; highest daily minimum temperature of 32 degrees F in 2001; record precipitation of 0.34 inches in 2001; record snowfall of 4.4 inches in 1999.

Average dew point for January 14th is 7 degrees F, with a maximum of 37 degrees F in 1947 and a minimum of -38 degrees F in 1972.

All-time state records for January 14th:

Scanning the state climatic data base: the all-time high for this date is 57 degrees F at Worthington, Browns Valley, Lamberton, Campbell, and Windom in 1987; the all-time low is -50 degrees F at Cook (St Louis County) and Cotton (St Louis County) in 1965. The all-time record precipitation amount for this date is 1.60 inches at Milan (Chippewa County) in 2001. The state record daily snowfall for this date is 12.0 inches at Campbell (Wilkin County) in 1923.

Past Weather Features:

January 14, 1875 was bitterly cold with a daytime high in the St Paul area of only -12 degrees F. The temperature would remain below 0 degrees F for a period of approximately 192 consecutive hours from midday on January 12th to midday on January 20th. This was to be one of the coldest Januaries in state history.

Following the famous "Children's Blizzard" of January 12, 1888 the temperature in St Paul fell to -43 degrees F and did not rise above -21 degrees F for a period of 48 hours.

Northern Minnesota communities were in the grip of arctic cold on January 14, 1965. At least two dozen cities reported lows of -40 degrees F or colder. Cotton in St Louis County bottomed out at -50 degrees F but warmed by 61 degrees to 11 F the next day.

A mid-winter "heat wave" prevailed over western Minnesota during January 12-14, 1987. Browns Valley hit 50 degrees F or higher three days in a row. There was little snow left on the ground afterwards.

Words of the Week: bogged

This is an Australian word for describing material and articles left in the outwash and mud of a flood. Thus many buildings, cars, and other materials swept away by floods this week in Queensland would be said to be "bogged." Seems very appropriate in this case as massive quantities of soil were moved by the overland floods in Australia, said to be the worst since 1974.

Outlook:

Lingering occasional snow flurries on Saturday, otherwise cold throughout the weekend. An increasing chance for snow by Monday and Tuesday, then continuing cold until next weekend, when some moderation in temperature is indicated.

Further Information:

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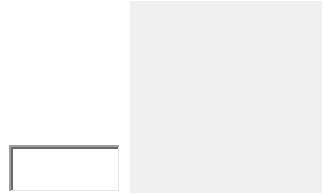
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Minnesota WeatherTalk Newsletter for Friday, January 21st, 2011

To: MPR Morning Edition Crew

From: Mark Seeley, University of Minnesota Extension

Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, January 21st, 2011

Headlines:

- January snow
- New seasonal climate outlook
- January temperature inversions
- Weekly Weather Potpourri
- MPR listener question
- Almanac for January 21st
- Past weather features
- Dust Score
- Outlook

Topic: January snow and cold

The frequency of snowfall, which we talked about last week, continues to be a source of irritation for commuters this week though few saw heavy snowfalls. Still, January 17th produced some significant snow reports from northeastern Minnesota observers. Silver Bay reported 7 inches that day, while Lutsen and Finland had 6 inches, Devil Track Lake 11 inches and in the uplands around Grand Marais one observer reported a snowfall of 17 inches. Hutchinson has received close to a foot of snow so far in

January and now reports over 67 inches for the season so far. Babbit in northeastern Minnesota has reported nearly 17 inches of snowfall in January and 62 inches for the season to date, while Wolf Ridge Environmental Learning Center near Finland has reported two feet of snow for January and over 60 inches for the season.

In western Minnesota where the spring snow melt flood threat seems to be already a high probability many observers are reporting well above normal snowfall. Some of these locations report the following amounts for January and the snow season to date:

Redwood Falls 12 inches in January and 52 inches for the season
Fargo, ND 11 inches in January and 56 inches for the season
Moorhead 15 inches in January and 59 inches for the season
Red Lake Falls 22 inches for January and 47 inches for the season
Wheaton 14 inches in January and 47 inches for the season
Rothsay 17 inches for January and 46 inches for the season
Worthington 16 inches for January and 44 inches for the season

Many observers also report 15, 16, even 17 days with snowfall so far this month. Through Friday, January 21st, in the daily national weather summary the coldest temperature in the 48 contiguous states has come from Minnesota eleven times. Babbit, MN has been below 0 F every night but two this month, and has reported -29 degrees F or colder on six mornings. On Tuesday, January 18 this week Flag Island on the ice covered Lake of the Woods never got warmer than -9 degrees F. On Friday, January 21st the coldest readings of the winter were recorded at nearly all locations across the state. Up north, Ash Lake and Big Fork reported -42 degrees F, Park Rapids and Waskish reported -40 degrees F, and International Falls reported -46 degrees F (coldest in the nation), coldest temperature measured there since 1968. Even Morton in southwestern Minnesota got as cold as -30 degrees F. The cold temperature pattern may continue reinforced by abundant snow cover on the ground, as many observers report snow depths of 20 to 30 inches, but some significant moderation in temperature is seen for next week.

Topic: New seasonal climate outlook

The NOAA Climate Prediction Center issued a new seasonal climate outlook on Thursday this week. The outlook calls for continued colder than normal temperature readings through April, and continued above normal snowfall through at least February across most of Minnesota. This pattern fits well with historical La Nina episodes.

Topic: Strong January temperature inversions

More often than not January brings the strongest temperature inversions of the year. An inversion is an increase in temperature with height above the surface. Typically in our region a morning launched instrumented balloon (radiosonde) will show a warming of several degrees as it ascends from the surface to altitude. For example the sounding from MPX (National Weather Service Forecast Office in Chanhassen, MN) on Thursday morning, January 20 showed a surface temperature of about -5 degrees F but the temperature about 1 kilometer altitude was +7 degrees F, 12 degrees F warmer. Under strong, large high pressure systems that bring clear skies and little wind the change in temperature with height can be remarkable. For example on January 19 (Wed) this week the Weather Service at Fairbanks, Alaska reported barometric pressure of 30.39 inches (very high) and a surface air temperature of -39 degrees F. But merely 100 meters above the surface the air temperature was -3 degrees F, 36 degrees F warmer.

Weekly Weather Potpourri:

Earlier this week the National Weather Service in Grand Forks, ND issued a preliminary outlook for the spring flood season along the Red River and its tributaries. There is a high risk for moderate to major flooding in many areas along the Red River. More detailed spring flood outlooks will be released in the coming weeks, but if you wish to keep abreast of the situation there you can go to their web page...

<http://www.crh.noaa.gov/fgf/>

A new study from UC-Davis documents how plants tend to move to lower elevation as a response to the combination of warmer temperatures and higher precipitation. This may have implications for plant migrations as climate continues to change and indicates that plant adaptation is driven significantly by available moisture and not just temperature change. You can read more about this study at...

<http://www.sciencedaily.com/releases/2011/01/110120142400.htm>

According to the BBC Australia's Prime Minister Julia Gillard may levy a one-time tax to help pay for recovery from the floods in Queensland and Victoria. Damages and rebuilding costs are estimated to be billions of dollars at a time when the government needs to cut expenses, thus, additional revenues may be needed. You can read more at...

<http://www.bbc.co.uk/news/world-asia-pacific-12247937>

Persistent heavy rains in January have brought flooding to portions of Zimbabwe, Mozambique, and South Africa. Many rivers have washed out of their banks as some

weather observers reported up to 4 inches of rain from thunderstorms earlier in the week. Many deaths due to flash flooding were reported from South Africa this week as well.

MPR Listener Question: I keep telling our friends who moved here from Arkansas that January is the coldest month of the year in Minnesota, but my neighbors says that is not true. Who's right?

Answer: You are right based on mean monthly temperature values. The lowest values are for January. However, your neighbor is right to point out there are many exceptions based on actual temperature records. For example taking the Twin Cities climate record since 1870, a period of 140 years, January is the actual coldest month of the year in 60 percent of the cases. December is the coldest month of the year 21 percent of the time, most recently in the year 2000, while February is the coldest month of the year 19 percent of the time, most recently in 2007. Back in 1914 both December and February were colder months than January, a very rare occurrence.

Almanac for January 21st:

The average MSP high temperature for this date is 23 degrees F (plus or minus 14 degrees standard deviation), while the average low is 6 degrees F (plus or minus 15 degrees standard deviation).

MSP Local Records for January 21st:

MSP weather records for this date include: highest daily maximum temperature of 48 degrees F in 1900; lowest daily maximum temperature of -17 degrees F in 1888; lowest daily minimum temperature of -41 degrees F in 1888; highest daily minimum temperature of 35 degrees F in 1934; record precipitation of 0.81 inches in 1917; record snowfall of 15.8 inches in 1917.

Average dew point for January 21st is 6 degrees F, with a maximum of 38 degrees F in 1934 and a minimum of -35 degrees F in 1970.

All-time state records for January 21st:

Scanning the state climatic data base: the all-time high for this date is 62 degrees F at Canby (Yellow Medicine County) in 1942; the all-time low is -58 degrees F at Rush City (Chisago County) in 1888. The all-time record precipitation amount for this date is 2.20 inches at Redwood Falls (Redwood County) and Tracy (Lyon County) in 1917. The state record daily snowfall for this date is 24.0 inches at Tracy (Lyon County) in 1917.

Past Weather Features:

Arctic cold gripped the state during January of 1888. Ft Snelling recorded -46 F and -45 F on the mornings of January 20 and 21, while even downtown St Paul fell to -41 degrees F on the 21st, the coldest reading ever. The Duluth Harbor observer reported -30 and -31 degrees F for the mornings of the 20th and 21st, while Rush City fell to -58 F on the 21st. St Vincent (Kittson County) in the Red River Valley reported 7 nights of -40 degrees F or colder that month.

January 21, 1917 brought a blizzard to western and central Minnesota counties. Some areas were isolated for days by high drifts. Heaviest snowfall amounts included 24 inches at Tracy, 22 inches at Redwood Falls and Lynd, 16 inches at Glencoe, Minneapolis, and Stillwater, 15 inches at St Peter, 13 inches at Pipestone and Farmington, 12 inches at Tyler and Zumbrota, 11 inches at Maple Plain, and 10 inches at Morris. Redwood Falls ended up with almost 3 feet of snow for the month of January 1917.

January of 1944 brought a prolonged thaw, almost a winter heat wave. Some observers reported that on 15 or more days the high temperature reached 40 degrees F or higher. At least 24 Minnesota communities reported a temperature of 60 degrees F or higher that month, and on Thursday and Friday, January 20-21, 1944 with temperatures in the 50s and 60s F many Minnesota citizens were seen taking their lunch break outside to enjoy the warm sunshine.

Words of the Week: Dust Score

NASA's satellite program called Atmospheric Infrared Sounder (AIRS) monitors a number of atmospheric components, including smoke, dust, and aerosols. One of the daily products is a Dust Score, displayed as a map showing areas where concentrations of dust are highest in the atmosphere. Currently large quantities of dust can be seen over portions of Africa and western South America. If you want to view this product you can go to...

<http://disc.sci.gsfc.nasa.gov/nrt/data-holdings/airs-nrt-products/airs-nrt-products#WMS>

Outlook:

Sunny and cold on Saturday across most of the state. Increasing clouds on Sunday with a chance for snow later in the day and into Monday. Mostly dry next Tuesday through Friday with moderating temperatures. Daytime highs will return to the teens and twenties F for most locations.

Further Information:

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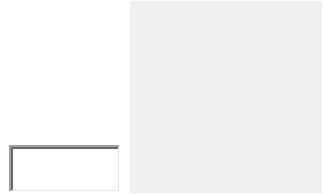
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Minnesota WeatherTalk Newsletter for Friday, January 28th, 2011

To: MPR Morning Edition Crew

From: Mark Seeley, University of Minnesota Extension

Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, January 28th, 2011

Headlines:

- Shallow ground frost
- Aerial snow survey and spring flooding
- Preliminary climate summary for January
- Weekly Weather Potpourri
- Almanac for January 28th
- Past weather features
- Blunk
- Outlook

Topic: Shallow ground frost most places

With the abundant snow cover the soil has been protected from freezing too deeply so far this winter. There are some southern Minnesota locations that have little or no frost, while in central and northern locations frost depth varies from 6 to 18 inches mostly. In the wind blown Red River Valley where snow depth varies, the frost depth at Crookston is 31 inches. Given the persistence of snow this winter, little further movement in depth of ground frost is expected. This may be known as the year of abundant snow depth but shallow frost depth.

Topic: Aerial Snow Survey Helping Spring Flooding Predictions

The NOAA National Operational Hydrologic Remote Sensing Center in Chanhassen performs aerial snow surveys for hydrologic predictions (water supply and flood potential). Earlier this month their aerial survey of Minnesota revealed significant quantities of water in the surface snow cover. Many areas show 2 to 3 inches of water equivalence in the snow cover, while some areas of the upper Minnesota River and Red River show high snow water content of 3 to 6 inches. These measurements will be made periodically throughout the winter to assess the spring snow melt flood threat. Certainly some occasional thaw periods in February would help alleviate this threat by gradually discharging the melt water from the snow pack. You can read more about the work of this NOAA Office at...

<http://www.nohrsc.noaa.gov/snowsurvey/>

The combined elements of frozen soils with abundant soil moisture, deep snow cover, high water content in the snow, and much winter still ahead of us add to the risk of moderate to major spring flooding on many Minnesota watersheds. A large number of watersheds have over a 60 percent probability of major flooding this spring, and some have over an 80 percent chance of major flooding, including the Mississippi River at St Paul. Those residents exposed on some of these flood plain locations are certainly encouraged to consider purchasing flood insurance which generally has a 30-day waiting period prior to execution of coverage. You can keep up to date on the threat of flooding by visiting the climate group web site...

http://climate.umn.edu/doc/journal/flood_2011/flooding_2011.htm

Topic: Preliminary climate summary for January

With only three days left in the month it is safe to say that January of 2011 was colder than normal. Average temperatures reported around the state are from 2 to 5 degrees F colder than normal (ave of the 1971-2000 period). Many observers reported at least one night when the low fell to -30 degrees F or colder. The coldest reading in the state was -46 degrees F at International Falls and Babbitt on January 21st and the warmest reading 36 degrees F at Canby and Dodge Center on the 27th. Minnesota reported the coldest temperature in the 48 contiguous states on 13 days during the month, the most of any state.

Precipitation quantities for the month have been mixed, with some observers reporting above normal values and some reporting below normal values. Most report near normal snowfall amounts, though some clearly received above normal amounts, including Rothsay and Fairmont with over 19 inches, Babbitt with 20.3 inches, Red

Lake Falls with 25.0 inches, and Wolf Ridge Environmental Learning Center near Finland with 27.2 inches. In addition several observers reported at least a trace of snow on 20 or more days this month.

Speaking of snow, the observer at Kabetogama now reports over 75 inches of snowfall for the season and a snow depth that is just under three feet. Certainly good snow shoeing at Voyageurs National Park this winter. Others with above normal snow seasons so far include Babbitt, Hutchinson, and International Falls with 65 inches, and Moorhead with nearly 60 inches.

Weekly Weather Potpourri:

Another heavy winter snow storm blanketed the northeastern states again this week over January 26-27, causing road and airport closures and delays. Central Park in New York picked up a record-setting 19 inches of new snowfall, while New Haven, CT picked up 16 inches, and Newark, NJ received 18.9 inches. Philadelphia, PA picked up over 15 inches and Wilmington, DE received over 10 inches. Central Park in New York has picked up over 56 inches of snowfall for the season so far.

The Government on Display exhibit at the Mall of America this weekend will feature some important local and regional NOAA offices. The National Weather Service Forecast Office in Chanhassen, the North-Central River Forecast Center, and the National Operational Hydrological Remote Sensing Center will have displays and personnel there both Saturday and Sunday. I am sure they would welcome your visit and any questions you might have. You can read more at....

http://www.crh.noaa.gov/news/display_cmsstory.php?wfo=mpx&storyid=62764&souce=0

Tropical Cyclone Wilma in the South Pacific was rapidly losing strength late this week as it approached the north coast of New Zealand. Winds had been as high as 150 mph producing nearly 30 foot seas. But by the time the storm hits New Zealand this weekend it is expected to weaken, with winds down to 50 mph. Additionally Tropical Cyclone Bianca was off the northwest coast of Western Australia (near Learmonth southwest of Port Hedland) and growing stronger. By the weekend it was expected to bring heavy rainfall along the coast, with wave heights of 25 feet and winds up to 110 mph.

An international team of scientists have reconstructed the historical weather patterns associated with global extremes since 1871. The new data sets will be available to the science community soon to take a look at pressure, temperature and precipitation patterns associated with such historical events as the Krakatoa eruption in 1883, the

sinking of the Titanic in April of 1912, or the famous New York hurricane of 1938. More about this work can be found at...

<http://www.sciencedaily.com/releases/2011/01/110124195615.htm>

Almanac for January 28th:

The average MSP high temperature for this date is 22 degrees F (plus or minus 13 degrees standard deviation), while the average low is 4 degrees F (plus or minus 15 degrees standard deviation).

MSP Local Records for January 28th:

MSP weather records for this date include: highest daily maximum temperature of 47 degrees F in 1892; lowest daily maximum temperature of -15 degrees F in 1966; lowest daily minimum temperature of -29 degrees F in 1873; highest daily minimum temperature of 34 degrees F in 1892 and 1944; record precipitation of 0.56 inches in 1909; record snowfall of 4.0 inches in 1912.

Average dew point for January 28th is 4 degrees F, with a maximum of 37 degrees F in 1914 and a minimum of -38 degrees F in 1966.

All-time state records for January 28th:

Scanning the state climatic data base: the all-time high for this date is 63 degrees F at Chaska (Carver County) in 1946; the all-time low is -50 degrees F at Pokegama Dam (Itasca County) in 1902 and at Baudette (Lake of the Woods County) in 1966. The all-time record precipitation amount for this date is 2.00 inches at Tracy (Lyon County) in 2003. The state record daily snowfall for this date is 12.0 inches at Caledonia (Houston County) in 1949.

Past Weather Features:

On January 28, 1914 a rare mid-winter thunderstorm crossed the central portion of the state bringing a good deal of thunder and lightning to Twin Cities residents. With temperatures near 40 degrees F the thunderstorm brought a quarter to a third of an inch of rain to many areas.

January 28, 1966 saw arctic high pressure bring record-setting cold temperatures across the entire state. Many northern communities reported -40 degrees F or colder. As far south as Forest Lake in the Twin Cities suburbs it was -32 degrees F. The cold spell stuck around through the end of the month.

Over January 26-29, 1996 a blizzard raged in south-central and southeastern Minnesota. Hokah in Houston County reported a snowfall total of 28 inches. Many roads and highways were closed, including Interstate 90 which turned into a parking lot with over 200 cars stranded along the shoulder.

Word of the Week: blunk

This term is used in the United Kingdom to refer to a period of squally, tempestuous weather that is usually sudden in appearance and short-lived. In Minnesota we might use the term to refer to a sudden snow squall. I guess some psychologists have used this term to refer to someone throwing a fit, said to be in a "blunk."

Outlook:

Colder with a chance for scattered snow flurries over the weekend. Better chance of snow late Sunday and into Monday, then remaining somewhat cold and dry much of next week, with more below zero F readings during the night.

Further Information:

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<http://www.climate.umn.edu/weathertalk/>

For access to other information resources go to

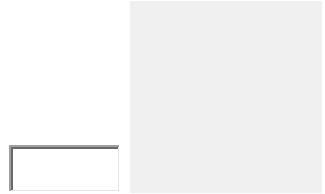
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Minnesota WeatherTalk Newsletter for Friday, February 4, 2011

To: MPR Morning Edition Crew

From: Mark Seeley, University of Minnesota Extension

Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, February 4, 2011

Headlines:

- Snowy, cold start to the week
- Super Bowl climatology
- Weekly Weather Potpourri
- MPR listener question
- Almanac for February 4th
- Past weather features
- jour de neige
- Outlook

Topic: Snowy, cold start to the week

In some areas of Minnesota the snow storm over January 31 to February 1 brought some significant additions to already deep snow cover. Some of those reporting near-record snowfall totals included: Pipestone 11.6", Marshall and Morgan 11.0", North Mankato 8.2", Fairmont 8.0", Bird Island 7.0", Montevideo 5.3", and New Ulm 5.0 inches. In some areas the blowing and drifting snow caused travel delays.

The arctic high pressure system that followed the snow storm brought very cold temperatures to Minnesota. Tower, Embarrass, Babbitt, Flag Island, and Crane Lake all saw temperatures fall to -30 degrees F or colder. A number of northwestern communities including Crookston, Moorhead, Red Lake Falls, and Warroad did not warm up much and remained below 0 degrees F all day on Wednesday this week. Fortunately by Friday temperatures are expected to warm into the mid-30s F, the warmest readings around the state since December 30, 2010. It will be relatively short-lived as two more Canadian arctic air masses are lined up to visit the state next week, bringing us a string of colder than normal weather.

Topic: Super Bowl Climatology

As people gather to watch the Super Bowl Game between Green Bay and Pittsburgh this Sunday evening there may be some conversations about past Super Bowls, where they were played and under what conditions. Thanks to the NOAA Southeast Regional Climate Office a complete Super Bowl climatology is available for all 44 previous games. You can find it at....

<http://www.sercc.com/SuperBowlClimate.pdf>

Weekly Weather Potpourri:

A massive winter storm formed over the Midwest this week and brought rain, freezing rain, ice, sleet, and snow to at least 30 states. A foot or more of snow fell in parts of MA, IN, ME, NH, NY, MI, KS, IL, IA, MO, OK, and WI. Over 20 inches fell in parts of Chicago. Heavy ice was reported in parts of CT, IL, IN, MO, and OH. In the warmer sector of the storm tornadoes were reported in LA and AL. Interstate Highways were closed in many states and thousands of flights were cancelled. You can read more about the storm at....

<http://www.hpc.ncep.noaa.gov/discussions/nfdsc5.html>

Cyclone Yasi hit Queensland Australia this week with 170 mph winds and sea waves of 42 feet. Though quite damaging to many areas, Australian officials were relieved that there were not many fatalities. The cyclone came on the heals of massive flooding damage last month.

<http://www.guardian.co.uk/world/2011/feb/03/cyclone-yasi-queensland-damage>

Cold temperatures in Europe were producing transportation problems this week. Black ice was to blame for a 50-vehicle crash near the Charles de Gaulle Airport

outside Paris. Blowing snow and black ice also caused hundreds of car crashes in northern Germany this week.

MPR listener question: Here we are in February and we are still seeing reports of -30 degrees F up north, and worse yet -40 degrees F windchills here in western Minnesota. Have we seen the worst of winter chill yet? I hope so.

Answer: I have a two part answer. Yes, I think the coldest temperatures of the season are behind us now, no more -30 F readings. But, I see a continuation of a colder than normal temperature pattern well into the month of February. Perhaps by the end of the month we will see a string of warmer than normal days materialize and bring widespread thawing.

Almanac for February 4th:

The average MSP high temperature for this date is 21 degrees F (plus or minus 15 degrees standard deviation), while the average low is 5 degrees F (plus or minus 16 degrees standard deviation).

MSP Local Records for February 4th:

MSP weather records for this date include: highest daily maximum temperature of 51 degrees F in 2005; lowest daily maximum temperature of -10 degrees F in 1895 and 1907; lowest daily minimum temperature of -28 degrees F in 1886; highest daily minimum temperature of 35 degrees F in 2005; record precipitation of 0.46 inches in 1945; record snowfall of 4.4 inches in 1971.

Average dew point for February 4th is 6 degrees F, with a maximum of 37 degrees F in 2005 and a minimum of -42 degrees F in 1947.

All-time state records for February 4th:

Scanning the state climatic data base: the all-time high for this date is 61 degrees F at Browns Valley (Traverse County) in 1991; the all-time low is -52 degrees F at Detroit Lakes (Becker County) in 1907. The all-time record precipitation amount for this date is 2.15 inches at Fort Ridgely (Nicollet County) in 1865. The state record daily snowfall for this date is 12.0 inches at Ortonville (Big Stone County) in 1943.

Past Weather Features:

Beginning on February 2, 1875 St Paul began a string of 16 consecutive days with nighttime temperatures below 0 degrees F. Between February 3 and February 11

every night saw the temperature fall between -20 and -30 degrees F, during one of the coldest Februarys in state history.

February 6, 1907 saw a dramatic rise in temperature at Detroit Lakes. After starting out the morning at -50 degrees F (the third morning in a row at -50 F or colder), the temperature rose 60 degrees F to plus 10 F by mid-afternoon, one of the largest daily changes in temperature ever recorded in the month of February.

February 4, 1936 brought an overnight low of -18 degrees F to the Twin Cities. It only "warmed up" to -5 degrees F that day. February of 1936 was the coldest in state history. The first 22 days of the month brought below 0 F overnight lows to the Twin Cities and the monthly total snowfall was nearly 20 inches. Wind chill readings were colder than -60 degrees F that month.

February 4, 1984 brought the development of a sudden ground blizzard across western and southern Minnesota. Winds gusted to 80 mph blowing snow and reducing visibility to zero on many highways. Temperatures dropped dramatically and wind chill readings ranged from -25 to -35 degrees F. The rapid onset of the storm left many people stranded in their motor vehicles or in their ice houses while fishing on frozen lakes. The storm claimed 16 lives due to exposure.

February 2-9, 1991 brought a respite from winter to western Minnesota communities. Many cities reported daytime highs of 50 degrees F or warmer, bright sunny skies, and no precipitation. Some farmers were seen doing chores in shirt sleeves and with no snow on the ground a few golf courses were open for business.

Word of the Week: Jour de neige

The french term for snow day was certainly in play this week for school systems and businesses across many Midwestern states and parts of French-speaking Canada. Back in December of 2010 even residents of Paris, France enjoyed a jour de neige on the 9th when heavy snow fell, enough to even close the Eiffel Tower.

Outlook:

Warming up over the weekend with many daytime readings in the 20s F and 30s F, before a cool down on Sunday. There will be widespread chances for light snow. Cooler and drier weather on Monday and for much of next week, with the temperature pattern returning to colder than normal before another warm up next weekend.

Further Information:

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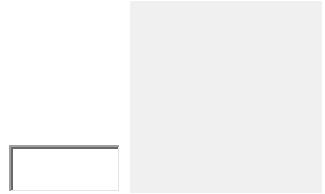
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Minnesota WeatherTalk Newsletter for Friday, February 11, 2011

To: MPR Morning Edition Crew

From: Mark Seeley, University of Minnesota Extension

Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, February 11, 2011

Headlines:

-It's official, 2010 was the wettest year in Minnesota

-Cold's last gasp

-Weekly Weather Potpourri

-MPR listener question

-Almanac for February 11th

-Past weather features

-stalagmites

-Outlook

Topic: 2010 was wettest year on record for Minnesota

The DNR-State Climatology Office has evaluated the climate data from last year in the context of state records since 1891 and concluded that on a statewide basis 2010 was the wettest year in history. The state averaged precipitation in 2010 was 34.10 inches surpassing the previous wettest year of 1977 which showed a statewide average of 33.74 inches. Total precipitation in 2010 ranged from less than 24 inches in parts of Cook County (far NE) to nearly 50 inches in Wabasha County. At least three dozen communities reported 40 inches or more of precipitation during 2010. September was

the wettest month of the year averaging nearly 6.50 inches of rainfall among several hundred observers.

Topic: Cold's last gasp

Well, I was wrong last week when I said that the days of -30 F or colder were finished for this winter. On Thursday, February 10th this week persistent arctic high pressure brought some very cold temperatures to northern Minnesota communities.

Kabetogama, Floodwood, and Isabella reported -30 degrees F, while Park Rapids reported -31 degrees F. Orr, Tower, and Hibbing fell to -32 degrees F, and International Falls reached -34 degrees F. Both Embarrass and Babbitt reported -37 degrees F, the coldest reading in the nation on February 10th. Then on Friday morning, Embarrass reached -39 degrees F. But a warming trend is on the way for the weekend and will likely stick around for several days.

Weekly Weather Potpourri:

A recent study from the Australian Institute of Marine Science shows that an upward trend in extreme rainfall events is evident across Queensland even in the context of the last 300 years. Using the growth patterns in near shore corals researchers have been able to reconstruct rainfall patterns. The recent storms in Queensland certainly fall in the extreme end of the historical distribution just like those from 1973-1974. You can read more about this study at...

<http://www.sciencedaily.com/releases/2011/02/110208144927.htm>

Tropical Cyclone Bingiza was nearly stationary off the coast of Madagascar in the Indian Ocean this week. It was expected to strengthen over the weekend with winds of 90-100 mph and sea heights over 20 feet. It is uncertain whether it will hit Madagascar.

The National Weather Service in Oklahoma reported a heavy snowfall event this week over February 8-9 when many observers reported 4 to 8 inches of new snowfall. The cold temperatures following the storm set many state records on February 10th. The ASOS station at Bartlesville, OK tied the state record low with a reading of -27 degrees F. Further north portions of Kansas received 10-12 inches of snowfall from the storm.

Dr. Jane Lubchenco, NOAA administrator delivered an address on scientific integrity and the NOAA Code of Scientific Conduct to a meeting of the Union of Concerned Scientists this week. Her remarks were pointed and illustrative of how serious NOAA

scientists are in honestly engaging the public on science issues. You can read her remarks at...

http://www.noaanews.noaa.gov/stories2011/20110209_scientificintegrity.html

MPR listener question: Though it has been a cold winter, I don't remember any days with highs below zero F in the Twin Cities. Is it rare for the Twin Cities to go through a winter without a daytime high below 0 F?

Answer: Indeed, despite mean temperature values that have been colder than average for the months of December, January, and February (so far), the climate reports for the Twin Cities show no daytime highs that have remained below 0 degrees F this winter. The closest to this occurred on January 21st and February 8th when the daytime high reached just 3 degrees F. Even International Falls which typically records 11 days each winter when the daytime high never reaches 0 F has reported only 3 such days this winter.

Looking at the Twin Cities climate record it is clear that we experience daytime highs colder than 0 F with less frequency than we once did. For the 60 years from 1891 to 1950 the climate records show only 4 winters when daytime high temperatures less than 0 degrees F were not observed. Conversely, from 1951 to 2010 there have been 13 such winters, including the past two in a row.

Almanac for February 11th:

The average MSP high temperature for this date is 24 degrees F (plus or minus 14 degrees standard deviation), while the average low is 7 degrees F (plus or minus 15 degrees standard deviation).

MSP Local Records for February 11th:

MSP weather records for this date include: highest daily maximum temperature of 57 degrees F in 1882; lowest daily maximum temperature of -15 degrees F in 1899; lowest daily minimum temperature of -31 degrees F in 1899; highest daily minimum temperature of 35 degrees F in 1882 and 1908; record precipitation of 0.28 inches in 1940 and 1965; record snowfall of 4.1 inches in 1979.

Average dew point for February 11th is 9 degrees F, with a maximum of 39 degrees F in 1999 and a minimum of -29 degrees F in 1981.

All-time state records for February 11th:

Scanning the state climatic data base: the all-time high for this date is 61 degrees F at Luverne (Rock County) in 1977; the all-time low is -55 degrees F at Leech Lake (Cass County) in 1899. The all-time record precipitation amount for this date is 1.36 inches at Fort Ripley (Crow Wing County) in 1861. The state record daily snowfall for this date is 14.0 inches at Mahnomen (Mahnomen County) in 1939.

Past Weather Features:

One of the coldest days in Twin Cities history occurred on February 11, 1875. After a morning low of -30 degrees F, the daytime high temperature only "warmed" to -14 degrees F, leaving a daily mean value of -22 degrees F. That long and challenging winter produced 21 days when the daytime high temperature in the Twin Cities never rose to 0 degrees F.

Blanketed under an arctic air mass, February 11, 1899 was one of the coldest days in state history. Leech Lake reported -55 degrees F, it was -48 degrees F at Tower, and -45 degrees F at Detroit Lakes. Even southern Minnesota locations set low temperature records that day as Pipestone reported -37 F, while Worthington and Farmington were both -35 degrees F. The temperature never rose above -26 degrees F at Detroit Lakes that day.

February 10-12, 1977 brought a respite from winter across southwestern Minnesota. Only a trace of snow cover remained on the ground as strong southwest winds ushered in warm air and most communities enjoyed three consecutive days in the 50s F.

Word of the Week: stalagmites

This is of course a geology term referring to the conical shaped mineral deposits found on the floor of caves. But there is a climate connection. Researchers have discovered that the layer composition of stalagmites is correlated to cave flood events induced by extreme precipitation. Using such correlation researchers can reconstruct the frequencies of flooding induced by extreme precipitation well back in time beyond the instrumental record.

University of Minnesota researchers (Dept of Geology and Geophysics) have done so for the caverns near Spring Valley, MN (Fillmore County). Analysis of the data there show that extreme precipitation events have been increasing in frequency, even in the context of a 3000 year old stalagmite record. You can read more about this study at...

<http://adsabs.harvard.edu/abs/2010E%26PSL.300...46D>

Outlook:

Much warmer over the weekend with a good deal of cloudiness and a chance for snow in the north. Continuing mild into next week as several days in succession will bring temperatures above the freezing mark. The north will continue to see chances for snow, but the remainder of the state will be mostly dry next week.

Further Information:

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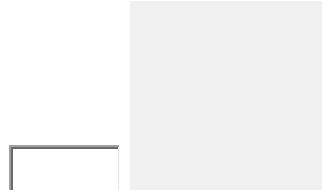
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Minnesota WeatherTalk Newsletter for Friday, February 18, 2011

To: MPR Morning Edition Crew

From: Mark Seeley, University of Minnesota Extension

Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, February 18, 2011

Headlines:

- New Climate Outlook
- Updated Hydrologic Outlook
- The Big Thaw
- Controls of Air Temperature
- Weekly Weather Potpourri
- MPR listener question
- Almanac for February 18th
- Past weather features
- glad, glade, glare
- Outlook

Topic: New Climate Outlook

The NOAA Climate Prediction Center released a new seasonal outlook this week for the period from March through May. It calls for below normal temperatures across the western Great Lakes Region, including Minnesota. In addition the outlook says there are equal chances for above or below normal precipitation during the period. More detail can be found at the CPC web site....

<http://www.cpc.ncep.noaa.gov/>

Topic: Updated Hydrologic Outlook for Minnesota

Also this week the National Weather Service in cooperation with the NOAA North-Central River Forecast Center issued updated hydrologic outlooks for spring flooding. The risk remains quite high (60-98 percent) for moderate to major flooding at all points along the Red River between North Dakota and Minnesota. In addition the risk is high for moderate to major flooding at some points (Montevideo, Mankato, and New Ulm) along the Minnesota and Cottonwood River watersheds. For the Mississippi River above Red Wing the risk is high for major or moderate flooding in St Paul, Hastings, and Red Wing, while high risk is also seen for the Crow River at Delano and high risk for moderate flooding of the St Croix at Stillwater. For further review of the details from the hydrologic outlook please go to our web site and choose a watershed region.....

http://climate.umn.edu/doc/journal/flood_2011/flooding_2011.htm

Topic: The Big Thaw

This week daily temperatures around the state rose to their highest level since mid-November of last year. The National Weather Service in Duluth reported that the period from February 13 to February 16 was the warmest such stretch of February weather in their history. Thus began the biggest thaw of the winter so far. Many places lost 3 to 8 inches in snow cover, flow volume, already high in many watersheds picked up in pace, and several observers reported temperatures of 50 degrees F or higher. Some of those reaching 50 F this week included many northern and central Minnesota communities: Cass Lake, Brainerd, Milaca, Collegeville, Forest Lake, Aitkin, Moose Lake, Two Harbors, Bemidji, and Waskish, as well as a number of other locations. By Friday, February 18th the thaw had ended with the passage of a strong cold front as temperatures fell off to single digits in many northern Minnesota communities.

Topic: What controls daytime air temperature in February

This time of year advection is a dominant control of our day to day air temperature. Advection in a traditional usage refers to the transport of atmospheric properties horizontally through large scale wind fields. If wind fields are from the northwest, a source of polar air masses moving over a snow covered Canadian landscape, then cooler temperatures generally prevail. When winds shift to the southwest or southeast they transport generally warmer and more moist air over the state.

In February advection effects prevail over surface heating due to bright sunny days because much of the sun's energy is being reflected back by snow cover. There is one exception to this in the northern coniferous forests of Minnesota that stand well above the snow cover and absorb the sun's energy, then emit it as heat. Back to back days in February can show different areas of the state to have the warmest temperatures depending on where it is sunny, where it is cloudy, where there is snow cover, where there is bare ground, and where the wind is coming from. Strikingly in northern Minnesota on Wednesday this week (Feb 16) the sun was shining most of the day and the forested region warmed dramatically, producing the highest temperature readings of the year so far. While many southern Minnesota communities remained in the upper 30s and lows 40s F Bemidji, Waskish, and Crane Lake set record highs with 55 degrees F. Big Fork, Orr, and Eveleth soared to 57 degrees F, new record highs for the date as well. Ely reported a record 59 degrees F, and Hibbing a new record 60 degrees F, the highest February temperature in history there.

As we move later into the spring and lose all of the snow cover the sun's effect on surface heating becomes greater relative to the effects of advection of air mass properties. Therefore sky condition, cloudy or clear, will play a more significant role in how warm it gets.

Weekly Weather Potpourri:

Two studies published in the journal Nature this week found linkages between climate change and recent extreme rainfall events. One study looking at extreme events in the Northern Hemisphere over the period from 1951-1999 found that they were 7 percent wetter. The other study found a link between climate change and extreme weather in the United Kingdom. You can read more about these studies at..

<http://www.nature.com/nature/index.html>

http://news.bbc.co.uk/weather/hi/news/newsid_9399000/9399694.stm

Three tropical cyclones were active this week in the southern hemisphere. Slow-moving Cyclone Carlos was bringing heavy rain to Darwin, Australia on Wednesday and Thursday, while stronger Cyclone Dianne was bringing strong winds, high seas, and heavy rain to Learmonth in Western Australia. In the Southern Indian Ocean Cyclone Bingiza was bringing heavy rain to Madagascar and Mozambique and was expected to dissipate by the weekend.

The NOAA web site this week highlights a map produced by the U.S. Coast Survey (NOAA's predecessor) showing the distribution of slaves in the USA prior to the Civil War. The map may have been used by Lincoln to coordinate his military operations with his emancipation policies. You can view the map and read more about it at....

http://www.noaanews.noaa.gov/stories2011/20110210_civilwarmap.html

A study released by the Cooperative Institute for Research in Environmental Sciences predicts a massive release of carbon into the Earth's atmosphere by the year 2200 due to the thawing of much of the polar permafrost. Measurements already show the release of carbon in the permafrost from Alaska and Siberia. You can read more from this study at...

<http://www.sciencedaily.com/releases/2011/02/110216132100.htm>

In order to engage the public about climate change and provide better education on climate science the United Kingdom Meteorological Office has begun a partnership with the Open Air Laboratories Network (OPAL Center) web site to address questions posed by all citizens. These questions will be addressed by the climate scientists at the Met Office. You can read more about this effort or submit questions yourself by going to the following web sites:

<http://www.metoffice.gov.uk/news/releases/archive/2011/OPAL-climate-centre>

<http://www.opalexplorenature.org/OPALClimateCentre>

MPR listener question: At what point in the coming month (March) does International Falls have the same daylength as the Twin Cities? Is it the vernal equinox on March 20th?

Answer: Actually according to the U.S. Naval Observatory, Astronomical Applications Branch, the daylength for International Falls and the Twin Cities will be roughly the same (within a minute of each other) for the period from March 16 to March 22, with the vernal equinox precisely at 6:21 pm CST on March 20th. Daylength on the vernal equinox will be 12 hours 9 minutes.

Almanac for February 18th:

The average MSP high temperature for this date is 27 degrees F (plus or minus 13 degrees standard deviation), while the average low is 11 degrees F (plus or minus 15 degrees standard deviation).

MSP Local Records for February 18th:

MSP weather records for this date include: highest daily maximum temperature of 58 degrees F in 1981; lowest daily maximum temperature of -4 degrees F in 1929; lowest daily minimum temperature of -21 degrees F in 1903; highest daily minimum

temperature of 36 degrees F in 1915, 1998, and 2002; record precipitation of 0.70 inches in 1961; record snowfall of 7.0 inches in 1961.

Average dew point for February 18th is 15 degrees F, with a maximum of 42 degrees F in 1981 and a minimum of -29 degrees F in 1941.

All-time state records for February 18th:

Scanning the state climatic data base: the all-time high for this date is 66 degrees F at Pipestone (Pipestone County) in 1981; the all-time low is -48 degrees F at Roseau (Roseau County) in 1966. The all-time record precipitation amount for this date is 1.80 inches at Black Duck (Beltrami County) in 2004. The state record daily snowfall for this date is 16.0 inches at Worthington (Nobles County) in 1962.

Past Weather Features:

February 18 of 1961 and 1962 brought heavy snows to parts of Minnesota. In 1961 snowfall of 6-10 inches occurred across southern Minnesota counties. It was welcome in many areas that had seen an absence of snow and frost depths go down to 3 feet or deeper in the soil. The next year on February 18, 1962 heavy snow fell across southern and western counties of Minnesota shutting down roads and highways. In fact the entire week was snowy at Fairmont (18 inches) and Worthington (25 inches) making driving difficult for several days.

The long, cold winter of 1978-1979 produced near record runs of days when the temperature never rose above freezing, especially in the north. As a result of the persistent cold by February 18, 1979 Lake Superior was completely ice covered, a very rare occurrence in historical terms.

Perhaps the most persistent February heat wave in state history occurred over February 15-25 in 1981. Some southwestern Minnesota communities saw the temperature rise to 50 degrees F or higher every day, with bright sunshine and little or no precipitation. The heat eliminated any snow cover and some farmers were seen doing field work. For 10 days Pipestone reported an average daily high of nearly 60 degrees F.

Words of the Week: Relationship of glad, glade and glare

I found it interesting that these words are all related and derived from similar origins - the Anglo Saxon term glaed, the Dutch glad, the German glatt and the Norwegian glada. All refer to brightness or shining (beauty) to some degree, as in "it was a glad evening" or "glad morning" (bright beautiful). "A beautiful glade of roses" refers to a

well lit opening or clear space (perhaps in a wooded area) where beds of roses are planted. A moonglade refers to the reflection of the moon on a still body of water. A lake or river glade this time of year is an opening in the frozen water. And of course an everglade is a flooded or inundated landscape dotted with islands or high patches of grass. The term glare is used in meteorology to refer to a type of ice that produces very bright, almost blinding reflection of light sometimes on roads, lakes or glaciers. This time of year a severe glare can be produced on automobile windshields by dusts and particles from the road surface. These types of particles scatter light predominately in a forward direction such that the glare produced by them is most pronounced when you are driving looking into the sun.

Outlook:

Cloudy and cooler over the weekend with a chance for snow later on Saturday. Snow on Sunday and Monday with significant accumulation across central parts of the state. Some rain and freezing rain is possible along southern counties. Warmer by mid week, with near normal temperatures and another chance for snow by Wednesday and Thursday.

Further Information:

For older versions of the "Minnesota WeatherTalk" newsletter go to

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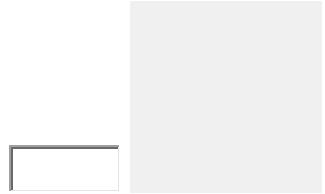
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Minnesota WeatherTalk Newsletter for Friday, February 25, 2011

To: MPR Morning Edition Crew

From: Mark Seeley, University of Minnesota Extension

Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, February 25, 2011

Headlines:

- Impact and implications of recent winter storm
- Preliminary climate summary for February
- Weekly Weather Potpourri
- MPR listener question
- Almanac for February 25th
- Past weather features
- Greenout
- Outlook

Topic: Snow totals and water equivalent from recent winter storm

The widespread snow storm of Sunday and Monday was one of the heaviest ever for February across many parts of the state. Many observers reported over a foot of snow. Bloomington and Eden Prairie reported 19 inches while Madison in Lac Qui Parle County reported 20 inches. The only other years in Minnesota's climate record when 20 inch snowfalls were reported in February were 1915, 1922, 1936, 1939, 1962, and 2001. So, not many. A complete summary of the storm total snowfall is available at the Minnesota State Climatology Office web site....

http://www.climate.umn.edu/doc/journal/snow110220_21.htm

In addition the National Weather Service in Chanhassen has created depictions of the storm and a recap at their web site.....

<http://www.crh.noaa.gov/mpx/>

The official Twin Cities snowfall for the season (from MSP airport) is now about 75 inches, ranking among the top ten historically. Others with impressive seasonal snowfall totals so far include: Fargo-Moorhead with 67 inches, Montevideo with 70 inches, Hutchinson with 85 inches, and Kabetogama with 87 inches.

A disconcerting feature of the week's heavy snow storm is the high water content which will add to the spring flood risk on some watersheds. Some of the higher precipitation quantities reported for February 20-21 included:

1.10 inches at Hastings and Zumbrota
1.12 inches at Theilman and Winnebago
1.16 inches at Worthington
1.20 inches at Morgan and Ortonville
1.21 inches at Browns Valley
1.25 inches at Jordan
1.32 inches at Fairmont and Madison
1.37 inches at Montevideo
1.80 inches at Springfield
1.93 inches at Lake City

All of these numbers are 2-3 times the normal February total precipitation values.

Topic: Preliminary climate summary for February

The average February temperature reported by most observers in Minnesota is very close to the 30-year normal despite some very chilly readings during the first half of the month. Recall that both December and January were distinctly colder than normal. Extremes across Minnesota during February ranged from 60 degrees F at Hibbing on the 16th to -39 degrees F at Embarrass on the 11th. Minnesota reported the lowest temperature in the 48 contiguous states 3 times during the month.

Total precipitation was mixed for the month of February. Northern counties generally reported less than normal precipitation, while most of the remainder of the state reported above normal precipitation for the month, mostly thanks to the winter storm of the 20th and 21st. Many observers reported above normal snowfall as well.

Average wind speeds in February were higher than normal as well with wind gusts of 30 mph or greater reported on 9 days.

Weekly Weather Potpourri:

A new NOAA based report presented this month to the AAAS shows that climate change will increase the risk of human illness from ocean, coastal, and Great Lakes ecosystems as the waters there continue to warm. Longer seasons with algal blooms is one feature that was studied in particular. You can read more from this report at...

http://www.noaanews.noaa.gov/stories2011/20110219_aaas_oceansandhealth.html

Also this week USDA/ARS researchers reported on a study that shows climate change is leading to a longer ragweed season in many parts of the country. The report shows that ragweed pollen is present in many parts of the USA and Canada for periods up to 30 days longer than it was before 1995. Seasonal warming shifts are correlated with this. You can find the report at...

<http://www.sciencedaily.com/releases/2011/02/110222140552.htm>

The National Weather Service in Fairbanks, Alaska this week was reporting heavy snowfall, in fact a record amount of 11.9 inches on February 21st, and 18.6 inches for a two-day storm total. They now have received 25.1 inches of snowfall this month, and 51.6 inches for the season, well ahead of normal for Fairbanks.

The National Weather Service was forecasting snow for the San Francisco Bay Area for Friday night. Less than an inch of snow is expected but it would be the first time that city has seen snow since February 5, 1976, over 35 years ago. Temperatures are expected to be in the mid 30s F overnight on Friday.

The NOAA Storm Prediction Center was expecting more severe weather across the southern states this weekend. 2011 has started relatively quiet in terms of severe weather with only 13 reports of tornadoes across the nation so far in January and February. However, on February 24th there were 5 reports of tornadoes in the states of Missouri and Arkansas, and more severe weather was expected across the south in the next few days.

MPR listener question: Though it has been a cold, snowy winter here in Minnesota I have not heard much about poor air quality due to inversions (temperature increase with height) and air stagnation. Have we had fewer air stagnation periods this winter due to prolonged inversions?

Answer: Indeed, without knowing the exact numbers of inversions and air quality alerts this winter I think it is safe to say we have seen fewer episodes, certainly when compared to last year when there were 23 air quality alerts in the Twin Cities area. Incidentally, when it comes to inversion intensity in the Twin Cities, we are coming up on the two months when inversion strength is the weakest, March and April.

Almanac for February 25th:

The average MSP high temperature for this date is 29 degrees F (plus or minus 12 degrees standard deviation), while the average low is 11 degrees F (plus or minus 13 degrees standard deviation).

MSP Local Records for February 25th:

MSP weather records for this date include: highest daily maximum temperature of 58 degrees F in 1976; lowest daily maximum temperature of 2 degrees F in 1934; lowest daily minimum temperature of -23 degrees F in 1967; highest daily minimum temperature of 42 degrees F in 2000; record precipitation of 0.44 inches in 1945; record snowfall of 4.1 inches in 1994.

Average dew point for February 25th is 14 degrees F, with a maximum of 52 degrees F in 2000 and a minimum of -30 degrees F in 1967.

All-time state records for February 25th:

Scanning the state climatic data base: the all-time high for this date is 66 degrees F at Beardsley (Big Stone) in 1958; the all-time low is -50 degrees F at Leech Lake (Cass County) in 1897. The all-time record precipitation amount for this date is 2.28 inches at Cass Lake (Cass County) in 1930. The state record daily snowfall for this date is 19.0 inches at Wolf Ridge Environmental Learning Center near Finland (Lake County) in 2001.

Past Weather Features:

An arctic cold wave had its grip on Minnesota during late February of 1934. Baudette reported 4 consecutive mornings of -30 degrees F or colder. Big Falls fell to -46 degrees F, Warroad -43 degrees F, and Roseau -42 degrees F. By the 28th of the month Big Falls had rebounded 88 degrees F to a daytime high of 42 F.

On February 25, 1958 many parts of western Minnesota were in the middle of a 5-day heat wave. Daytime temperatures ranged from the mid 50s to mid 60s F under bright

sunny skies. By the end of the month most of the snow cover across the state had melted.

A big, slow moving snow storm dropped 1-2 feet of snow across Minnesota over February 24-25, 2001. Lutsen Mountain received 23 inches, Wolf Ridge Environmental Learning Center near Finland received 21.5 inches, and Moose Lake reported 17 inches of snow. Fortunately the snow storm came over the last weekend of February, but it closed many roads until Monday.

Word of the Week: greenout

This term used by those who spend time in polar latitudes refers to the emotion felt in spring when green things begin to appear again. You have a "greenout" experience or a hopeful high. Perhaps a greenout is what we are all looking for after this long winter with continuous snow cover.

Outlook:

Cooler than normal over the weekend with a chance for snow in southern counties. Continued cool next week with a chance for snow again in the north by Tuesday and a chance of snow in the south by Thursday.

Further Information:

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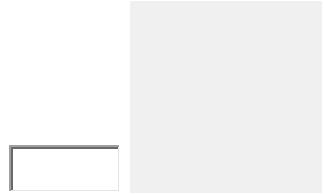
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Minnesota WeatherTalk Newsletter for Friday, March 4, 2011

To: MPR Morning Edition Crew
From: Mark Seeley, University of Minnesota Extension
Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, March 4, 2011

Headlines:

- La Nina and March Snowfall
- Snow records fall at Rochester
- Updated Hydrologic Outlook
- Weekly Weather Potpourri
- MPR listener question
- Almanac for March 4th
- Past weather features
- Verglas
- Outlook

Topic: La Nina and March Snowfall

Since 1950 a modest to strong episode of La Nina (the cool water dominance in the central equatorial Pacific Ocean) has been in play 15 times during Minnesota's winter season. Such has been the case this winter as well. In ten of these 15 years March snowfall has been well above normal, averaging nearly 20.5 inches. Is this historical correlation a suitable predictor? Perhaps not, but it certainly appears our dose of snowfall will be significant through the first half of this March.

Topic: Records fall at Rochester, MN

The National Weather Service reported this week that the 60.4 inches of snowfall reported at the Rochester, MN airport from December 1, 2010 to February 28, 2011 is a new record amount for the three month period, breaking the old record of 50 inches set in 1950-1951. In addition they report that the average snow depth over the three-month period of 16.9 inches is a new record as well, surpassing that of 1978-1979 when the average snow depth was 14 inches.

Topic: Updated Hydrologic Outlook for Minnesota

On March 3 and 4 National Weather Service Offices in the region updated the hydrologic outlook related to spring flooding potential. Factoring in the President's Day snow storm for many watersheds elevated the probability of flooding.

For the Red River Valley, the probability of major flooding at several key locations remains 90 percent or higher. These locations include Wapeeton-Breckenridge, Fargo-Moorhead, Halstad, Grand Forks, Oslo, Drayton, Pembina, among others. At Fargo, the probability of reaching the all-time record flood crest of 40.84 ft (2009) is close to 30 percent.

Along the Minnesota River the probability for major flooding remains quite high. At Montevideo where major flooding occurs at 17.5 ft, the probability is close to 100 percent, while the probability of the Cottonwood River reaching major flood stage (16 ft) at New Ulm remains close to 100 percent as well. Elsewhere the Redwood River at Marshall shows about a 30 percent probability of reaching major flood stage (16 ft) while the Minnesota River at Mankato shows about a 35 percent probability of reaching major flood stage (30 ft).

The Mississippi River at St Paul has close to a 100 percent chance of reaching major flood stage, but more importantly there is close to a 40-45 percent chance of reaching the all-time flood crest of 26.40 ft (1965). A similar probability for a record flood crest exists for the Mississippi River at Hastings.

Major flood stage is a 90 percent probability for the St Croix at Stillwater, and there is a 20 percent probability for a record flood crest (94.1 ft). For the Des Moines River at Jackson there is a 30 percent probability for major flooding.

The entire series of hydrologic outlooks, numerical tables and discussions are available at:

http://climate.umn.edu/doc/journal/flood_2011/flooding_2011.htm

Weekly Weather Potpourri:

The Bureau of Meteorology in Australia reports the Perth recorded its hottest summer in history averaging over 86 degrees F. In fact there were 59 days over 86 degrees F, and many very warm nights as well when the low never fell below 70 degrees F. Meteorologists are blaming the warm Pacific Ocean around Australia as a factor in keeping the overnight minimum temperatures at high levels. You can read more at...

http://news.bbc.co.uk/weather/hi/news/newsid_9410000/9410399.stm

The National Park Service predicts an earlier than normal peak bloom for the Washington, D.C. Cherry Blossom Festival later this month. Ample moisture along with warming temperatures are expected to accelerate the blooming process, which normally peaks about April 4th. You can read more about this at....

http://www.usatoday.com/weather/forecast/2011-03-03-cherry-tree-forecast-washington-dc_N.htm

MPR listener question: How often do back to back snowy winters come to the Twin Cities area? Any chance next winter will be as snowy as this one (currently about 76 inches)?

Answer: Actually back to back snowy winters are somewhat of a rarity in our state. In the modern era climate records of the Twin Cities the winters of 1950-1951 (88.9") and 1951-1952 (79") standout for bringing abundant and persistent snow cover along with spring floods. The winters of 1968-1969 and 1969-1970 were both snowy thanks to very heavy snows in December. The longest uninterrupted string of snowy winters was from 1981-1982 through 1985-1986 when seasonal snowfall totals were:

1981-1982 95.0"
1982-1983 74.4"
1983-1984 98.6"
1984-1985 72.7"
1985-1986 69.5"

Since that time the only back to back snowy winters came in 2000-2001 and 2001-2002 with 75.8" and 66.0", respectively.

Almanac for March 4th:

The average MSP high temperature for this date is 33 degrees F (plus or minus 11 degrees standard deviation), while the average low is 17 degrees F (plus or minus 12 degrees standard deviation).

MSP Local Records for March 4th:

MSP weather records for this date include: highest daily maximum temperature of 61 degrees F in 1983 and 2000; lowest daily maximum temperature of 8 degrees F in 1917; lowest daily minimum temperature of -22 degrees F in 1873; highest daily minimum temperature of 50 degrees F in 1894; record precipitation of 0.80 inches in 1984; record snowfall of 9.6 inches in 1984.

Average dew point for March 4th is 16 degrees F, with a maximum of 53 degrees F in 1983 and a minimum of -17 degrees F in 1978.

All-time state records for March 4th:

Scanning the state climatic data base: the all-time high for this date is 70 degrees F at Currie (Murray County) in 1905 and again at Luverne (Rock County) in 2000; the all-time low is -43 degrees F at Bagley (Clearwater County) and Pokegama Dam (Itasca County) in 1917. The all-time record precipitation amount for this date is 3.54 inches at Isabella (Lake County) in 1966. The state record daily snowfall for this date is 26.0 inches also at Isabella (Lake County) in 1966.

Past Weather Features:

An arctic cold wave dominated the state the first four days of March in 1873. Fort Ripley reported morning lows of -3 F, -24 F, -35 F, and -21 F during that period, while Fort Snelling reported 4 F, -20 F, -24 F, and -22F. Two days later on March 6, 1873 the temperature had rebounded in the 40s F.

On March 4, 1917 the state was again in the grip of arctic high pressure that brought record-setting cold temperatures.

Over March 2-5, 1966 a slow moving winter storm brought very heavy snow to central and northern Minnesota locations. Over 25 communities reported at least 20 inches of new snow. High Landing, Isabella, Itasca State Park, and Park Rapids received over 30 inches of snow. Road and school closures were common and many buildings were damaged by the heavy snow load. Minnesota highway patrol and police departments used snowmobiles to rescue stranded motorists as they were the only means of transportation.

Itasca State Park reported over 40 inches of snow that March.

Another large winter storm passed across the state over March 2-4, 1985. Many observers reported at least of foot of new snow. Brainerd and Benson received over two feet of snow. Blizzard conditions prevailed as well, as winds gusted to 68 mph at Rochester and 71 mph at Duluth. Drifts as high as 20 feet closed many roads, including Interstate 94. By the end of the month Mankato reported a snow depth of 49 inches.

Word of the Week: Verglas

Derived from the Old French "verre-glaz, this term used in climbing and trail walking refers to a thin coating of ice on rocks, objects and trails which makes climbing and hiking more difficult and dangerous. The ice coating is thick enough not to crack immediately under pressure, but it is thin enough that spikes and pitons cannot grip it well.

Outlook:

Cooler than normal over the weekend. Increasing cloudiness on Sunday with chances for snow in the west. Then chances for snow increase for next Monday through Wednesday, followed by colder temperatures. The mid-week snow may be quite significant in places.

Further Information:

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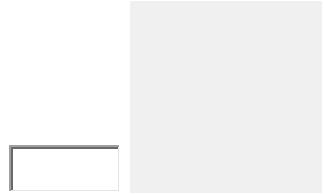
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Minnesota WeatherTalk Newsletter for Friday, March 11, 2011

To: MPR Morning Edition Crew

From: Mark Seeley, University of Minnesota Extension

Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, March 11, 2011

Headlines:

- Comments on spring flooding
- Flood Response Resources
- Weekly Weather Potpourri
- MPR listener questions
- Almanac for March 11th
- Past weather features
- Outlook

Topic: Comments on the Five Factor Conceptual Model for Spring Flooding

Decades ago before numerical models were used in hydrology to forecast floods, Joe Strub the chief meteorologist in the Twin Cities used a five factor scaling model to estimate the potential for spring snowmelt floods. The five factors were:

1. Estimates of fall soil moisture recharge up until soil freeze-up going into winter
2. Measurements of frost depth in the soil.
3. Measurements of seasonal snowfall, and snow water content in the snow cover.

- 4.Forecasts of spring (especially March and April) precipitation.
- 5.Forecasts of spring thaw period, both intensity and duration.

When all or most of these factors are above historically averaged values, the threat of flooding is high. In the context of the current situation in Minnesota for this winter the only factor that has been below normal is the depth of soil frost, which was less than normal around the state this year. In fact in many places there is little of any soil frost left. But the BIG PLAYERS in the threat of spring flooding this year are (1) saturated soils with little room to hold more water, and (2) abundant seasonal snowfall and snow water content (4-6 inches) that is yet to melt and begin flowing through the state's watersheds.

Obviously the biggest uncertainties rest with the final two factors in this conceptual model: Will March and April deliver above or below normal precipitation amounts? Models suggest that precipitation will be above normal for the second half of March. It also looks like March may start to exhibit a warm up as early as next week, but hopefully there will be frequent freeze/thaw cycles to gradually meter out runoff from the snow pack. Models suggest April may be cooler than normal, but there are not significant recent trends in April temperatures. There is no consensus in the models about April precipitation being above or below normal. As for the rate of thaw, the latter half of March looks to be much warmer than normal and will trigger a runoff response in most Minnesota watersheds, likely by March 20th. Hopefully we will see little additional precipitation before that time.

The next spring flood outlook from NOAA will be released over March 24th using the ensemble hydrologic models, unless there is a dramatic change in the weather pattern.

Topic: Flood Response Resources

In preparing for and responding to floods and their associated disruption and damage the University of Minnesota Extension has prepared a variety of information and educational resources for citizens to use. Most of these can be accessed via the web. You can view this information at....

<http://www.extension.umn.edu/extreme-weather/flood/prepare/>

If you live or work along a watershed subject to high risk of flooding this spring, I encourage you to take a look at these resources.

Weekly Weather Potpourri:

Thursday, March 10 was one of the most active severe weather days so far this year. The NOAA Storm Prediction Center filed 21 tornado reports that day from LA, MS, AL, GA, and FL. In Louisiana a tornado was sighted pass across Lake Pontchartrain, while in Mississippi the storms damaged a number of mobile home parks.

A USDA-ARS sponsored project to develop an AgroAtlas matching world climates and cropping regions was announced this week as a web based tool to examine the distribution of crop diseases, pests, and weeds. It can also be used to examine the suitability of different growing regions for the use of new crops and new crop varieties. You can read more about it at....

<http://www.sciencedaily.com/releases/2011/03/110310112319.htm>

Communities in Queensland, Australia still trying to recover from massive flooding in February were hit by more heavy rainfalls this week. Flooding this week reportedly cut off the cities of Cardwell, Mission Beach, and Tully Heads. Soils in parts of Queensland are so saturated they have little capacity for additional rainfalls, which are expected this week. You can read more at...

<http://www.bbc.co.uk/news/world-asia-pacific-12696114>

The cities of Ottawa, Hamilton, and Montreal reported 6 to 10 inches of snowfall this week. The snow caused travel disruption and many accidents. As many as 1000 snowplows were operating in the Montreal area to keep roads open.

MPR listener question: I have seen that the 79.7 inches of snowfall so far this winter in the Twin Cities ranks 7th among historically high seasonal snowfall totals. But I was wondering how we rank relative to the persistence of snow cover. Seems like a long winter to me because we have had continuous snow cover since late November. How do we rank historically in the Twin Cities climate record relative to snow cover?

Answer: We have to use relatively modern records to look at this question, because the older snow depth records are not consistent enough to examine the full duration of snow cover. In terms of measured snow cover of at least 1 inch depth, we have now recorded 110 days (not consecutive) with a value of at least that during the winter of 2010-2011. According to Greg Spoden of the Minnesota State Climatology Office this would rank 11th among those winters with persistent 1 inch snow cover, the modern record being 136 days in the winter of 1964-65. If we continue to have at least 1 inch snow cover in the Twin Cities for at least another week we will move up to 7th in the historical ranking.

MPR listener question: Looking at the climate records for Minnesota which years have produced widespread historical spring snow melt floods like those projected for this spring?

Answer: From historical accounts (written narratives and sparse flow data) there were many years in the 19th Century with widespread and severe spring floods, most often during the month of April. Some of these years included 1826, 1852, 1861, 1862, 1873, 1881, and 1897. Since that time gage measurements of flow have shown significant floods in 1951, 1952, 1965, 1969, 1979, 1997, 2001, and 2009, among other years. Many of these years were used as case studies to calibrate and establish hydrologic models for Minnesota watersheds so that forecasters could more accurately predict flood crests. Each flood event is carefully studied and used to improve our ability to predict future floods.

Almanac for March 11th:

The average MSP high temperature for this date is 37 degrees F (plus or minus 10 degrees standard deviation), while the average low is 21 degrees F (plus or minus 12 degrees standard deviation).

MSP Local Records for March 11th:

MSP weather records for this date include: highest daily maximum temperature of 61 degrees F in 1902; lowest daily maximum temperature of 6 degrees F in 1906; lowest daily minimum temperature of -27 degrees F in 1948; highest daily minimum temperature of 45 degrees F in 1977; record precipitation of 1.30 inches in 1990; record snowfall of 8.2 inches in 1962.

Average dew point for March 11th is 20 degrees F, with a maximum of 50 degrees F in 1990 and a minimum of -34 degrees F in 1948.

All-time state records for March 11th:

Scanning the state climatic data base: the all-time high for this date is 66 degrees F at Marshall (Lyon County) in 1990; the all-time low is -41 degrees F at Moose Lake (Carlton County) and Pine River (Cass County) in 1948. The all-time record precipitation amount for this date is 3.00 inches at Waseca (Waseca County) in 1918. The state record daily snowfall for this date is 16.0 inches at New London (Kandiyohi County) and Sauk Center (Stearns County) in 1897.

Past Weather Features:

During the coldest March in Minnesota history that of 1843, 8 of the first 11 days brought below zero F readings to Fort Snelling. Ice on the river below the Fort was reported to be very thick and remained so until the end of the month.

On March 11, 1878 there was no ice cover left on Lake Minnetonka, the earliest ice-out date in the history of that monitored lake. This followed arguably the mildest winter in Minnesota history, that of 1877-1878, when 28 days over the December through February period brought temperatures of 40 degrees F or higher and the first 10 days of March 1878 brought daytime temperatures in the 50s and 60s F. Planted small grains had already emerged in southern Minnesota counties.

March 9-10, 1892 a blizzard brought 13 inches of snow to Duluth, accompanied by 60 mph winds. Snow drifts up to 10 feet high were noted in the city, even blocking second story windows of buildings. Temperatures fell by as much as 35 degrees F during the storm.

A modest snow storm (3-6 inches) over March 7-9, 1948 ushered in an arctic air mass that brought record-setting cold temperatures to Minnesota on March 10th and 11th. Over 50 communities reported a low of -30 degrees F or colder, and 9 communities fell below -40 degrees F in one of the most widespread March cold waves ever.

Outlook:

Cloudy with a chance of snow in the north this weekend. A windy day is in store for Saturday. Temperatures will remain generally below normal values for this time of year. Increased cloudiness on Monday and Tuesday with warmer temperatures and a chance for snow or rain. Continued warming next week and another chance for precipitation by Thursday and Friday as well.

Further Information:

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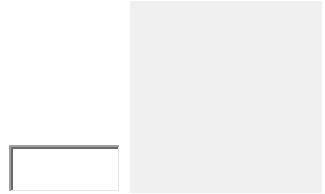
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Minnesota WeatherTalk Newsletter for Friday, March 18, 2011

To: MPR Morning Edition Crew

From: Mark Seeley, University of Minnesota Extension

Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, March 18, 2011

Headlines:

- Stretch of warmth settles in this week
- New Climate Outlooks Released
- Rivers show rises
- Weekly Weather Potpourri
- MPR listener question
- Almanac for March 18th
- Past weather features
- MACPEX
- Outlook

Topic:

Topic: Stretch of Warmth

This week the Twin Cities and other Minnesota cities embarked on the first stretch of 50 F weather since the second week of November, 2010. Granted there was a single day of 50 degrees F back on February 16th, but that was very short-lived, lasting barely two hours in the afternoon. This week and weekend will apparently bring a

stretch of 3-5 days of 50 F weather to some southern MN cities, before cooling down again on Tuesday. Winona and Blue Earth reported highs of 58 F on St Patrick's Day, while Wells hit 59 degrees F. Even as far north as Leech Lake and Hibbing reported 51 degrees F this week. The stretch of warmth will lead to some rivers reaching flood stage in southern counties.

Stretches of 50 F weather lasting longer than one week in the month of March are somewhat rare. For the Twin Cities they occurred in 1905, 1910, 1925, 1938, 1945, 1973, and most recently 2007. Back in 1910 the daytime high temperatures were above 50 degrees F for 17 consecutive days for March 15-31, peaking at 83 degrees F on the 23rd. Such a stretch is not in the cards this year.

Topic: New Seasonal Climate Outlooks from NOAA-CPC

The new monthly and seasonal climate outlooks were released this Thursday (March 17) by NOAA's Climate Prediction Center. The outlook for April favors cooler and wetter than normal conditions across Minnesota. The cooler than normal temperature pattern is expected to persist as well for the spring and early summer, and into July. A wetter than normal pattern is expected in the Red River Valley through June. These outlooks are based on La Nina correlations, recent time series trends in climate and the soil moisture anomaly (surplus) across the region. The current La Nina episode is expected to dissipate by June.

Topic: Rivers Starting to Rise

The National Weather Service reported that many rivers were starting to rise by Thursday of this week as a result of the warming temperatures. At several gaging points along Minnesota watersheds rises of more than 2 feet were measured by Friday of this week, including over a 3 ft rise in the Redwood River near Marshall, a nearly 3 ft rise in the Des Moines River at Jackson, over a 3 ft rise in the Minnesota River at Mankato, and over a 7 ft rise in Turtle Creek (expected to rise above flood stage by Saturday) near Austin. Many rivers are expected to show further rises this weekend, and several will approach minor or moderate flood state criteria next week. You can follow the river rises by observing the hourly gage readings at the following web site.....

http://www.crh.noaa.gov/ncrfc/index.php?view=hydro_obs

Just click on the geographic area of interest, then the specific city or watershed.

Weekly Weather Potpourri:

During Flood Safety Awareness Week (March 14-18) NOAA and FEMA are reminding citizens of the dangers of flooding, as well as encouraging those who live on flood plains to consider purchasing flood insurance. Spring flooding already began this week in parts of New Jersey where some schools had to be closed. Exposure to spring snow melt flooding is widespread this year as many parts of the USA landscape endured a snowier than normal winter. You can read more at...

http://www.noaanews.noaa.gov/stories2011/20110314_springoutlook.html

A more complete national briefing about the spring flood threat is offered by NOAA on their web site which you can read at....

http://www.noaanews.noaa.gov/stories2011/20110317_springoutlook.html

If you think we have had a snowy winter in Minnesota consider the Sierra-at-Tahoe Resort in California. They report that through March 7th they have received 507 inches of snow, more than 40 feet. And they still tend to get quite a bit more snow in March and April. They may approach the record level of 1982-1983 when the snow season brought 756 (63 ft) inches to the resort.

NOAA Administrator Dr. Jane Lubchenco announced plans this week for its strategic plan to study the Arctic sea ice. NOAA will use its resources to improve forecasting in the Arctic, advocate for better stewardship of its resources and try to help advance the resilience of healthy Arctic communities. You can read more about this at...

<http://www.externalaffairs.noaa.gov/>

Tropical Cyclone Cherono was churning northeast of Reunion Island in the Southern Indian Ocean. It was producing wind gusts over 60 mph and sea wave heights between 15-20 ft on Friday. Cyclone Cherono is expected to head over Reunion Island and turn south away from Madagascar over the weekend and into early next week.

MPR listener question: I see that the National Weather Service has mentioned a chance for thundershowers on Sunday. How often do we get thundershowers in March?

Answer: For the Twin Cities the historical frequency of a thundershower during the month of March is one. That is on average there is one day with a thundershower each March. Thundershowers in March can deliver 0.50 inches of rainfall in a short period of time, but rarely deliver over 1 inch. We may get thundershowers across southern and central counties on Sunday.

Almanac for March 18th:

The average MSP high temperature for this date is 39 degrees F (plus or minus 11 degrees standard deviation), while the average low is 23 degrees F (plus or minus 11 degrees standard deviation).

MSP Local Records for March 18th:

MSP weather records for this date include: highest daily maximum temperature of 71 degrees F in 1921; lowest daily maximum temperature of 3 degrees F in 1923; lowest daily minimum temperature of -8 degrees F in 1923 and 1941; highest daily minimum temperature of 48 degrees F in 1968 record precipitation of 1.07 inches in 1968; record snowfall of 5.3 inches in 2005.

Average dew point for March 18th is 23 degrees F, with a maximum of 50 degrees F in 1921 and a minimum of -14 degrees F in 1923.

All-time state records for March 18th:

Scanning the state climatic data base: the all-time high for this date is 84 degrees F at Canby (Yellow Medicine County) in 1921; the all-time low is -48 degrees F at Sawbill Camp (Cook County) in 1939. The all-time record precipitation amount for this date is 2.48 inches at Collegeville (Stearns County) in 1903. The state record daily snowfall for this date is 20.0 inches at Albert Lea (Freeborn County) in 1933.

Past Weather Features:

Over March 18-19, 1903 a two-day rain storm brought 2-3 inches across portions of central Minnesota. Communities like Montevideo, New London, Collegeville, St Cloud, New Ulm, and Bird Island received a whole months worth of rain in one storm.

On March 18, 1921 a five-day heat wave began in many western Minnesota counties. Temperatures soared into the 70s and 80s F. There was no snow left on the ground from winter and some farmers were seen working their fields.

On March 18, 1925, some residents of Missouri, Illinois, and Indiana probably thought the world was coming to an end. The famous Tri-State tornado was crossing those states, along a 219 mile path over a period of 3.5 hours, from 1:00 to 4:30 pm. This F-5 storm (winds near 300 mph) damaged or destroyed 19 communities and killed 695 people. The vortex varied from 1/2 mile to 1 mile in diameter. It caused the greatest loss of life of any historically documented tornado in the USA.

In 1939, following snow earlier in the week, the temperature plummeted in north-central and northeastern Minnesota setting all-time low temperature marks on March 18th at many locations. At least 10 observers reported lows of -30 degrees F or colder, and some were colder than -40 F. At Sawbill Camp in Cook County the morning low of -48 degrees F was an all-time state record for March 18th, but the very next day the Sawbill observer reported an afternoon high of 44 degrees F, a temperature rise of 92 degrees F.

At 5:30 pm on March 18, 1968 an F-2 (113-157 mph) tornado traveled 4 miles on the ground near Truman in Watonwan County destroying some farm buildings before it dissipated. It is the earliest date on the calendar that a tornado has ever been reported in Minnesota.

Word of the Week: MACPEX

This acronym stands for Mid-latitude Airborne Cirrus Properties Experiment, a new effort by NASA to better understand the composition of mid-latitude cirrus clouds and their role in climate. They will study the ice crystal structure of these clouds, including the water vapor isotopes and scales of eddies aloft that lead to their formation. Several different instrumented aircraft will participate in this experiment starting this month. You can read more at....

<http://www.sciencedaily.com/releases/2011/03/110315142526.htm>

Outlook:

Continued warmer than normal temperatures into the weekend with increasing cloudiness later on Saturday. Chance for showers late Saturday and most of the day on Sunday. Possible snow showers in the north. Continued chance for rain and snow showers into Monday as well. A cooling trend starts on Tuesday next week with a chance for snow by Wednesday. A warming trend towards the end of next week with increasing chances for showers.

Further Information:

For older versions of the "Minnesota WeatherTalk" newsletter go to

<http://www.climate.umn.edu/weathertalk/>

For access to other information resources go to

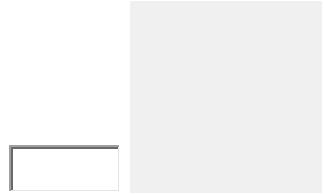
<http://www.climate.umn.edu/Seeley/>

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Minnesota WeatherTalk Newsletter for Friday, April 8, 2011

To: MPR Morning Edition Crew
From: Mark Seeley, University of Minnesota Extension
Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, April 8, 2011

Headlines:

- Snowfall up north to start April
- Red River flooding this weekend
- Severe Weather Awareness Week
- Weekly Weather Potpourri
- MPR listener question
- Almanac for April 8th
- Past weather features
- Plout and Skiff
- Outlook

Topic: Snowfall up north to start April

The first four days of April brought cold and snow to many north-central and northeastern Minnesota communities. Some snowfall totals for these early April days included: 5.3 inches at Duluth, 5.4 inches at Two Harbors, 4.5 inches at Wolf Ridge (near Finland), 6.5 inches at Cloquet, 3 inches at Embarrass and Floodwood, 2.6 inches at International Falls, and 2 inches at Ely. Elsewhere early April precipitation was light across the state. In addition some cold air hung across Minnesota over the first week of April. Embarrass started April Fool's Day with a morning low of just 13

degrees F, and then on the 5th (Tuesday) they reported the lowest temperature reading in the 48 contiguous states with a minimum of just 15 degrees F.

Topic: Red River flooding this weekend, secondary crests possible elsewhere

The North Central River Forecast Center and National Weather Service call for a Red River crest at Fargo-Moorhead this weekend of around 39 to 40 feet. This would perhaps be the 2nd or 3rd highest crest measured there. Uncertainty about this forecast is dictated to a large degree by the amount of precipitation that may occur this weekend and early next week. The flood crest is currently projected to arrive by Sunday (Apr 10), but may linger with the onset of any significant precipitation across the area. Weather forecasts suggest a third to three quarters of an inch of precipitation may occur across the area over the weekend, with more rain or snow by next Tuesday and Wednesday.

Elsewhere over the Minnesota, Mississippi, and St Croix watersheds precipitation forecasts for the weekend favor amounts ranging from a half to one inch, with a chance that localized thunderstorms may deliver even heavier amounts. This would lead to some secondary flood crests on southern watersheds. So nearby communities and residents need to stay abreast of changing weather and observe changes in river flows over the weekend. Most of this information can be found at...

http://climate.umn.edu/doc/journal/flood_2011/flooding_2011.htm

Topic: Severe Weather Awareness Week, April 11-15

The annual Severe Weather Awareness Week will take place next week with a number of educational messages and safety tips issued by the National Weather Service and tornado drills on Thursday, April 14th at 1:45 pm and 6:55 pm. This is a good time of year to check that your NOAA weather radio is in working order and to review severe weather safety tips with your family. When it comes to severe weather many federal, state and local government organizations partner to educate and protect Minnesota citizens. I will participate on Monday (Apr 11) morning in a press conference with the MN Department of Public Safety and Division of Homeland Security and Emergency Management designed to kick-off Severe Weather Awareness Week. If you want to review more information and educational content you can go to any of these web sites...

<http://www.severeweather.state.mn.us/>
<http://www.crh.noaa.gov/mpx/?n=swaw>
<http://www.extension.umn.edu/extreme-weather/>

Weekly Weather Potpourri:

NOAA's Storm Prediction Center in Oklahoma had perhaps their busiest day of the year on Monday (April 4th) as at least 16 states reported episodes of severe weather. There were 66 reports of tornadoes, mostly from AR, LA, TN, and KY. In addition there were 90 reports of large hail and hundreds of reports of strong thunderstorm winds. More severe weather is expected during the second week of April as well.

The National Snow and Ice Data Center (Boulder, CO) reported last week that the maximum extent of arctic sea ice recorded on March 7th was the lowest in the measured record going back to 1979. This measurement fits with the data trend over the last decade of shrinking arctic sea ice extent. You can read more about this at...

<http://www.sciencedaily.com/releases/2011/03/110324104143.htm>

The United Kingdom Meteorological Office and BBC Weather Center reported last week the March of 2011 was the driest across the United Kingdom since 1953 (58 years). Many places reported less than 1.50 inches for the month, especially in Wales. Not only did many areas see little rainfall, but some reported very few days with rain at all.

Many meteorologists from various government weather services are in Ethiopia, Africa this week attending a coordinated health conference. Delegations from 30 African countries are present. One of the topics being discussed is how weather forecasts might be better used to anticipate outbreaks of malaria (rainfall related) and meningitis (dust related). In addition they will be discussing high temperature related impacts on food security and water quality. Many African nations suffer from lack of adequate governmental weather services.

MPR listener question: With so many Minnesota communities affected by moderate to major spring flooding right now, would a federal government shutdown this weekend have any serious implications for the NOAA National Weather Service Forecast Offices or the North-Central River Forecast Center? It seems their information and services are so critical right now.

Answer: To the best of my knowledge a federal government shutdown might affect some administrative positions in the NOAA organizations, but it would certainly not affect personnel engaged in critical observational and forecast operations. Those would continue on a 24/7 basis as always in coordination with state and local units of government.

Almanac for April 8th:

The average MSP high temperature for this date is 51 degrees F (plus or minus 12 degrees standard deviation), while the average low is 32 degrees F (plus or minus 8 degrees standard deviation).

MSP Local Records for April 8th:

MSP weather records for this date include: highest daily maximum temperature of 83 degrees F in 1931; lowest daily maximum temperature of 30 degrees F in 1928; lowest daily minimum temperature of 9 degrees F in 1997; highest daily minimum temperature of 55 degrees F in 1988; record precipitation of 0.73 inches in 1906; record snowfall of 5.0 inches in 1980.

Average dew point for April 8th is 26 degrees F, with a maximum of 58 degrees F in 1903 and a minimum of -4 degrees F in 1997.

All-time state records for April 8th:

Scanning the state climatic data base: the all-time high for this date is 92 degrees F at Canby (Yellow Medicine County) in 1931; the all-time low is -12 degrees F at Sawbill Camp (Cook County) 1939. The all-time record precipitation amount for this date is 2.45 inches at Dawson (Lac Qui Parle County) in 1894. The state record daily snowfall for this date is 13.2 inches at Moorhead (Clay County) in 1904.

Past Weather Features:

On April 9, 1887 about 4:30 pm an F-2 tornado (winds 113-157 mph) began a journey across Polk County in northwestern Minnesota. Fortunately the population density at that time was very sparse and no injuries were reported. However a number of rural homes were reported damaged or destroyed.

On April 8, 1894 parts of western and central Minnesota experienced a late winter storm bringing a mixture of snow and rain. Bingham Lake reported 1.70 inches, Montevideo 1.58 inches, Granite Falls 1.42 inches, Sauk Center 1.75 inches, and Dawson 2.45 inches. In addition Dawson reported 4 inches of snow and Sauk Center reported 5 inches of snow. In the drought year of 1894, this storm produced the largest daily dose of precipitation for the entire year at many of these locations.

The state was in the midst of a brief two-day April heat wave over the 7th and 8th in 1931. Temperatures soared to levels that were 25 to 35 degrees F above normal over those two days. Many observers reported daytime highs in the 70s and 80s with strong southerly winds. A severe dust storm was reported in St Paul on the 9th. By the 10th overnight lows fell back below the freezing mark.

Word of the Week: Plout and Skiff

Plout is a word found in the Scottish dictionary to refer to a heavy fall of rain. If this condition lasts for a long time it is said to be "plousy" outside. Conversely a skiff (spit) from old European language roots refers to a wind-driven light rain or snow, usually somewhat short-lived. Obviously April in Minnesota can bring either skiffs or plouts.

Outlook:

The weekend will bring above normal temperatures but a chance of showers each day. There may be some thunderstorms across southern Minnesota counties late Saturday and Sunday, and perhaps even severe weather. Stronger winds will be in place by Sunday and Monday as well. Cooler temperatures on Monday, then a returning chance for showers on Tuesday and Wednesday next week.

Further Information:

For older versions of the "Minnesota WeatherTalk" newsletter go to

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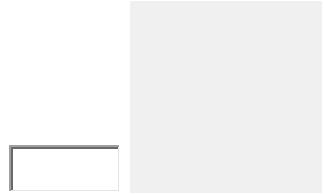
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Minnesota WeatherTalk Newsletter for Friday, April 15, 2011

To: MPR Morning Edition

From: Mark Seeley, University of Minnesota Extension
Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, April 15, 2011

Headlines:

- Severe Weather Awareness Week Wraps Up
- Wet start to April for some
- Weekly Weather Potpourri
- MPR listener question
- Almanac for April 15th
- Past weather features
- Bedrabble
- Outlook

Topic: Severe Weather Awareness Week wraps up

Today wraps up Severe Weather Awareness Week in Minnesota with messages about the hazards of excess heat. The activities this week serve to reminds us to think about our response to severe weather warnings both in the work place and at home.

Many information resources are available to learn about severe weather and safety tips. You can use either of the following web sites:

<http://www.crh.noaa.gov/mpx/>

<http://www.severeweather.state.mn.us/>

Topic: Very wet start to April for some

Thanks to last weekend's thunderstorms several northern Minnesota observers now report above normal precipitation for the month. Some of these include:

Warroad 2.11 inches, 0.90 inches above normal

Cass Lake 2.33 inches, 0.50 inches above normal

Little Fork 2.23 inches, 0.31 inches above normal

International Falls 1.99 inches, 0.61 inches above normal

Kabetogama 2.17 inches, 0.67 inches above normal

Southeastern Minnesota observers also reported heavy rainfall last weekend, some totaling over 2 inches. Grand Meadow

(Mower County) reported 2.44 inches on April 10th, breaking the all-time state record for the date of 2.40 inches at

Bricelyn (Faribault County) in 1947.

Warmer than normal temperatures during the first two weeks of April have helped speed along the ice out on southern

Minnesota lakes. Many lakes from Albert Lea to White Bear Lake have seen the ice disappear over this past week. A

cooling trend from now until the last week of the month will likely slow this process and the state's remaining lakes.

You can keep up to date

on the progress of lake ice out in Minnesota by going to

http://www.dnr.state.mn.us/ice_out/index.html

Weekly Weather Potpourri:

Speaking of severe weather, late on Thursday, April 14th severe storms developed across the southern plains states and the

southeast. There were 11 tornado reports (OK and KS) and 125 reports of hail. Five people were killed in AR and OK.

More severe storms are expected across the southeastern states on Friday.

Weather is supposed to be near ideal for the London Marathon this Sunday (April 17) and the thousands of runners and

spectators involved. Temperatures during the event will range from 55 to 65 degrees F, perhaps leading to some good running times.

A very interesting analysis and describing of the severe weather outbreak across the southeastern USA last week is available at the U.S. Severe Weather Blog. You can find this at...

<http://www.norman.noaa.gov/2011/04/april-4-5-2011-severe-weather/>

MPR listener question: I saw in the MPR Updraft blog this week that the April 10 and 11 thunderstorms produced some daily record rainfall amounts in places, some over 2 inches. How unusual is it to receive daily rainfall of 2 inches or greater in the month of April?

Answer: Indeed, it is pretty unusual. Up north where both Mahnomen and Cass Lake reported over 2 inches of rainfall on April 11th those were the greatest 24 hour quantities ever measured at those stations during the month of April, about a once in one hundred year occurrence. Along southern Minnesota at Grand Meadow and Austin record rainfall amounts of over 2 inches were reported on the 10th. However their climate records show a 2 inch rain storm occurs during April about once every 25 years.

Almanac for April 15th:

The average MSP high temperature for this date is 56 degrees F (plus or minus 11 degrees standard deviation), while the average low is 36 degrees F (plus or minus 8 degrees standard deviation).

MSP Local Records for April 15th:

MSP weather records for this date include: highest daily maximum temperature of 91 degrees F in 2002; lowest daily maximum temperature of 32 degrees F in 1951; lowest daily minimum temperature of 18 degrees F in 1875 and 1935; highest daily minimum temperature of 56 degrees F in 1915 and 1931; record precipitation of 0.99 inches in 1873; record snowfall of 2.0 inches in 1961.

Average dew point for April 15th is 33 degrees F, with a maximum of 61 degrees F in 1976 and a minimum of 4 degrees F in 1995.

All-time state records for April 15th:

Scanning the state climatic data base: the all-time high for this date is 93 degrees F at Canby (Yellow Medicine County) in 2003; the all-time low is 2 degrees F at Zumbrota (Goodhue County) in 1928 and at Orr (St Louis County) in 1962. The all-time record precipitation amount for this date is 2.96 inches at Sandy Lake Dam (Aitkin County) in 1894. The state record daily snowfall for this date is 13.0 inches at Virginia (St Louis County) and Mahoning Mine (St Louis County) in 1961.

Past Weather Features:

Following a fresh snowfall on the 14th, Fort Snelling soldiers woke up to a temperature of just 13 degrees F on April 15, 1857. It was the coldest April in history. The average monthly temperature was just 32 F, with strong winds, cloudy, and often snowy conditions prevailing. Snowfall was noted on 8 different days, totaling about 10 inches. Winds blew greater than 45 mph on at least two days, and combined with the cold temperatures produced wind chill values below zero F. From the 15th to the 18th low temperatures were 13, 11, 12, and 16 F, respectively.

An April heat wave persisted back in 2002. Over April 15-16 as many as 20 Minnesota cities reported reaching 90 degrees F or higher. Fortunately the spell was short-lived as daytime temperatures fell into the 60s and 70s F by the 18th.

Word of the Week: Bedrabbled

Has anyone ever said "you look bedrabbled today?" Hopefully not. Not common in too many dictionaries this word (pronounced BEE-Drabble) refers to befouling the soil making it wet and muddy. April showers thus bedrabbled the flower beds and gardens awaiting to be tended this spring.

Outlook:

Chance of rain or snow Saturday with much colder temperatures, then mostly cloudy and continued cool the rest of the weekend. Chance for rain and snow again by next Tuesday and Wednesday as much of next week will continue to be cooler than normal.

Further Information:

For older versions of the "Minnesota WeatherTalk" newsletter go to

<http://www.climate.umn.edu/weathertalk/>

For access to other information resources go to

<http://www.climate.umn.edu/Seeley/>

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Minnesota WeatherTalk Newsletter for Friday, April 22, 2011

To: MPR Morning Edition Crew
From: Mark Seeley, University of Minnesota Extension
Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, April 22, 2011

Headlines:

- Record snows on April 19-20
- New Seasonal Climate Outlooks
- Easter Climatology
- Weekly Weather Potpourri
- MPR listener question
- Almanac for April 22nd
- Past weather features
- Imbriferous
- Outlook

HAPPY EARTH DAY, APRIL 22, 2011

Topic: Record snows for some on April 19-20

A large storm system passed across southeastern Minnesota earlier this week, leaving some record-setting snowfall amounts in its wake. On the evening of the 19th

Rochester reported a record 3.8 inches, La Crosse, WI a record 3.1 inches, and Preston a record 5.2 inches. Then on the morning of April 20th Winona Dam reported a record 3.0 inches, La Crescent 5.1 inches, and Spring Grove 5.8 inches. Fortunately afternoon temperatures in the 40s F melted the snow in short order.

To the north of this storm system temperatures were remarkably cold. Cass Lake, Itasca State Park, and Big Falls reported just 19 degrees F on the 19th, while Kabetogama and Orr were just 15 degrees F. It was 13 degrees F at Tower and 10 degrees F at Babbitt. Embarrass reported the coldest reading in the state with 9 degrees F.

Topic: New Seasonal Climate Outlooks

The NOAA Climate Prediction Center released new season climate outlooks on Thursday of this week. For the months of May through July they call for cooler than normal temperatures across the Great Lakes Region, including Minnesota. In addition they call for greater than normal precipitation in northwestern sections of the state and the far southeastern counties as well. Some of this guidance is based on persistent high soil moisture levels, as well as climate continuity from trends so far in 2011. You can find more information at...

www.cpc.noaa.gov

Topic: Easter Climatology

Easter falls rather late on the calendar this year at April 24th. The forecast calls for sunny skies and daytime temperatures in the 50s and 60s F, a nice Easter Day in historical context. Here in the Twin Cities Metro Area Easter Sunday has been as warm as 88 degrees F in 1977 (April 10), but as cold as -2 degrees F with a daytime high of only 15 degrees F in 1894 (March 25). It snowed 2.5 inches on Easter Sunday in 1929 (March 31) as the temperature never rose above 33 degrees F. Easter Sunday of 1951 (March 25) still had 22 inches of snow on the ground, so egg hunting involved digging snow.

You can read more about historical Easter weather in my book Minnesota Weather Almanac on pages 143-149.

Weekly Weather Potpourri:

The NOAA Storm Prediction Center in Oklahoma has certainly had a busy month of April. So far there have been 419 reports of tornadoes in April, with over 100 reports on both the 15th and 16th. You can read more at...

<http://www.spc.noaa.gov/climo/online/monthly/newm.html>

Persistent drought in Texas has produced severe and prolific wildfires. Some areas of the state recently recorded their driest March in history. Further a number of counties have already appealed for federal disaster relief to assist in fighting the fires. You can read more about this at....

<http://www.theatlantic.com/infocus/2011/04/texas-wildfires/100050/>

University of Illinois atmospheric scientists have used satellite based passive microwave data to study the structural rings around tropical storms. They have found patterns that reveal when the storm is undergoing rapid intensification. Their findings can be used as a tool for hurricane forecasters to assess when tropical storms might undergo rapid intensification and become a greater threat. You can read more about this study at...

<http://www.sciencedaily.com/releases/2011/04/110420152102.htm>

As spring progresses many citizens begin to suffer from allergies. There are many online resources to examine air quality and pollen forecasts. Some of those that might be useful include:

<http://www.pollen.com/allergy-weather-forecast.asp>

http://home.comcast.net/~halethorpe_weather/wx15.html

<http://aqi.pca.state.mn.us/>

MPR listener question: Over the years many of you have asked me to distinguish between the words "weather" and "climate?" Here are some possible answers.

Answer: I always describe weather as the environmental conditions that exist right now and climate as the historical average for the date. As climate (averages) changes over time, the probability for specific types of weather changes as well. But there are many other, more clever distinctions made through analogies by colleagues in the American Association of State Climatologists, including:

climate trains the boxer, weather throws the punches
climate is like your baseball batting average, weather is your current time at bat
climate tells you what clothes to buy, weather tells you what clothes to wear
climate is what you expect, weather is what you get
climate is the Dow Jones Average, weather is an individual stock

climate is my personality, weather is my mood today
climate is the tide, weather is the individual wave
climate is the traffic, weather is an individual car

Almanac for April 22nd:

The average MSP high temperature for this date is 59 degrees F (plus or minus 11 degrees standard deviation), while the average low is 39 degrees F (plus or minus 8 degrees standard deviation).

MSP Local Records for April 22nd:

MSP weather records for this date include: highest daily maximum temperature of 90 degrees F in 1980; lowest daily maximum temperature of 34 degrees F in 1967; lowest daily minimum temperature of 23 degrees F in 1874; highest daily minimum temperature of 61 degrees F in 1913; record precipitation of 2.21 inches in 2001; record snowfall of 5.4 inches in 1963.

Average dew point for April 22nd is 35 degrees F, with a maximum of 67 degrees F in 1925 and a minimum of 10 degrees F in 1953.

All-time state records for April 22nd:

Scanning the state climatic data base: the all-time high for this date is 101 degrees F at Hawley (Clay County) in 1980; the all-time low is 0 degrees F at Canby (Yellow Medicine County) in 1952. The all-time record precipitation amount for this date is 3.52 inches at St Cloud (Stearns County) in 2001. The state record daily snowfall for this date is 10.0 inches at Moorhead (Clay County) in 1902 and at Pigeon River (Cook County) in 1931.

Past Weather Features:

An intense April heat wave prevailed on this date in 1980. Over April 20-22 many western Minnesota communities endured three consecutive days of daytime temperatures in the 90s F. Ada, Georgetown, Browns Valley, Campbell, and Montevideo all hit 100 degrees F while Hawley reached 101 degrees F, the highest reading ever for the month of April. Farmers were planting in dry soil as that month of April was the 3rd driest in state history. Many locations in the Red River Valley reported only a trace of precipitation for the entire month. The heat wave abated sharply with temperatures falling off into the 60s F by the 23rd.

2001 brought the 2nd wettest month of April in state history, as the average precipitation statewide was nearly 5.50 inches. A massive storm brought heavy rains and snows over the 21st to the 23rd. Park Rapids, Breckenridge, Campbell, Bagley, and Bemidji reported snowfalls of 8 to 12 inches. Daily precipitation records were set at many locations on the 22nd, including 2.37 inches at Granite Falls, 2.57 inches at Collegeville, 2.86 inches at Winsted, 3.30 inches at Redwood Falls, 3.21 inches at Tracy, and 3.52 inches at St Cloud. The precipitation enhanced the widespread spring flooding on many Minnesota rivers.

Word of the Week: Imbriferous

This is a hardly used adjective anymore, but it means showery or rain-bearing. Thus one might say "look at the imbriferous cloud formation." Apparently this word has Latin roots, meaning showery.

Outlook:

Partly cloudy weekend, with some chance for precipitation up north. The daytime high temperatures will be in the 50s and 60s F, with a sunny day on tap for Easter Sunday. Increasing clouds late Monday with a chance for showers Tuesday and Wednesday next week. Much of next week looks to be wet.

Further Information:

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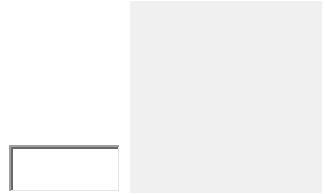
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Minnesota WeatherTalk Newsletter for Friday, April 29, 2011

To: MPR Morning Edition Crew
From: Mark Seeley, University of Minnesota Extension
Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, April 29, 2011

Headlines:

- Storm over April 26-27, plenty of moisture for some
- Preliminary climate summary for April
- Weekly Weather Potpourri
- MPR listener question
- Almanac for April 29th
- Past weather features
- Blash
- Outlook

Topic: Storm over April 26-27, plenty of moisture

A large storm system brought widespread precipitation to the state over Tuesday and Wednesday (April 26-27) this week. Many areas received between 0.50 and 1.50 inches of precipitation. The Twin Cities (MSP) reported a record amount of 1.46

inches on the 26th. Austin also had a record 1.17 inches, and so did the University of Minnesota St Paul Campus with 1.58 inches.

Up north the storm brought snow in the early morning of the 27th. Many observers reported from 1 to 4.5 inches, with even greater amounts over northern Wisconsin. Embarrass, Grand Marais, and Chisholm reported a record 3.0 inches for April 27th.

Topic: Preliminary April Climate Summary

For many climate observers in Minnesota, April was cool with mean monthly temperatures ranging from 1 to 3 degrees below normal. Extreme values for the month ranged from 84 degrees F at Preston on the 11th to just 9 degrees F at Embarrass on the 19th. Minnesota reported the coldest temperature reading in the 48 contiguous states just once, on April 14th when Grand Marais recorded a morning low of 14 degrees F.

Except for some western Minnesota communities, nearly all observers in the state reported above normal April precipitation. Many had over 3 and 4 inch totals for the month. La Crescent, Grand Meadow, Rushford, and Austin reported over 5 inches in April, more than twice the normal amount. Some locations in northeastern Minnesota reported up to a foot of April snowfall as well.

Weekly Weather Potpourri:

According to the NOAA-Storm Prediction Center a massive weather system produced over 200 tornado reports on Wednesday (April 27) this week. The concentration of tornadoes was primarily in MS, AL, and TN. The preliminary total tornado reports for April nationwide is now very close to 700, a record number. Media reports say 213 people were killed in Alabama, and the death toll overall may be over 300.

Historically only about six tornado outbreaks have produced a higher death toll, the last being over April 3-4, 1974 when 330 people died.

NOAA announced this week that they will undertake a comprehensive study of the wakes from wind turbines. They are concerned about what the downstream effects may be on the efficiency of other wind turbines. This study will take place in Colorado over the coming summer. You can read more about it at...

http://www.noaanews.noaa.gov/stories2011/20110426_windwakes.html

A new study published by faculty at UCSB (University of California-Santa Barbara) faculty documents the environmental impacts of major urban ecosystems in the Twin Cities. Joe McFadden and Jennifer King, faculty at UCSB and former University of

Minnesota researchers have published this study in Ecological Applications. Their study highlights how household waste impacts ecosystems in a variety of ways. You can read more about this at...

<http://www.sciencedaily.com/releases/2011/04/110429095227.htm>

The National Weather Service in Phoenix, AZ reported that on April 26, 2011 the recorded lowest humidity reading for the Phoenix area was tied when the instruments could only record 2 percent relative humidity. This has happened on a few other occasions in the area historically, most recently on June 24 last year.

MPR listener question: If the National Weather Service forecasts through Saturday April 30th are correct, the mean temperatures for the month of April will be colder than normal. Going back to December of 2009 this would mark 5 consecutive months of below normal temperatures in our state. When was the last time this happened?

Answer: The last time cooler than normal monthly mean temperatures were so persistent was from the fall of 1995 through the spring of 1996, when 9 consecutive months (September of 1995 to May of 1996) showed values that were cooler than normal. Summer temperatures in 1996 rebounded to normal levels.

Almanac for April 29th:

The average MSP high temperature for this date is 62 degrees F (plus or minus 12 degrees standard deviation), while the average low is 43 degrees F (plus or minus 8 degrees standard deviation).

MSP Local Records for April 29th:

MSP weather records for this date include: highest daily maximum temperature of 92 degrees F in 1952; lowest daily maximum temperature of 35 degrees F in 1909; lowest daily minimum temperature of 22 degrees F in 1958; highest daily minimum temperature of 61 degrees F in 1952; record precipitation of 1.30 inches in 1991; record snowfall of 6.6 inches in 1984.

Average dew point for April 29th is 37 degrees F, with a maximum of 66 degrees F in 1942 and a minimum of 7 degrees F in 1958.

All-time state records for April 29th:

Scanning the state climatic data base: the all-time high for this date is 93 degrees F at New Ulm (Nicollet County) and Pipestone in 1910; the all-time low is 3 degrees F at

Babbitt (St Louis County) in 1958. The all-time record precipitation amount for this date is 3.25 inches at Orr (St Louis County) in 1940. The state record daily snowfall for this date is 14.0 inches at Windom (Cottonwood County) in 1956.

Past Weather Features:

Soldiers at Fort Ripley in central Minnesota must have wondered if spring would ever come back in 1875. Having endured a very cold winter, April 19th brought a morning low of 20 degrees F and an afternoon high of only 34 degrees F. In fact during one of the coldest Aprils of the 19 Century, 1875 brought 27 days of morning temperature readings that were below freezing.

April 29, 1952 brought a brief heat wave to western Minnesota. At least 9 communities reported a daytime high of 90s degrees F or better. It remained warm at night with many temperatures just falling off into the 60s F.

April 29, 1956 brought heavy snow to southern Minnesota. Windom reported 14 inches, while Waseca and Fairmont received 8 inches of snowfall. Fortunately it was short-lived and farmers were seen working the fields by the following week.

Between 6:00 pm and 8:00 pm on the evening of April 30, 1967 there was an outbreak of tornadoes across southern Minnesota. These storms traveled across portions of Freeborn, Waseca, Olmsted, Mower, and Steele Counties. Thirteen people were killed and over 80 injured by these storms. The largest of these tornadoes, an F-4 (winds 207-260 mph) was on the ground for 40 miles and passed through Albert Lea, leveling 26 homes and damaging another 64.

In April of 2001 residents of Hastings, MN saw two separate flood crests pass by on the Mississippi River. On April 29, the 3rd highest flood crest in history was measured there at 22 feet. This was 0.4 feet higher than the flood crest which went by earlier that same month on the 17th. Only flood crests in 1969 (24.30 feet) and 1965 (25.9 feet) were higher at Hastings.

Word of the Week: Blash

A combination of blow and splash, this term is used when rain falls in sheets, some of them coming horizontally. Such was the case on Tuesday (April 26) this week in St Paul. Covered by an umbrella during my walk to work I noticed that my pants from just above the knees on downward were entirely soaked by the blash coming at me on an east wind.

Outlook:

Rain likely on Saturday, perhaps mixed with snow in the north, and some thunderstorms in the south. Continued cooler than normal Sunday through Tuesday, but drier. Warmer by Wednesday and Thursday with another chance for rain showers.

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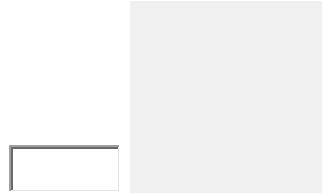
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Minnesota WeatherTalk Newsletter for Friday, May 6, 2011

To: MPR Morning Edition Crew
From: Mark Seeley, University of Minnesota Extension
Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, May 6, 2011

Headlines:

- Cold, snowy start to May
- Weekly Weather Potpourri
- MPR listener question
- Almanac for May 6th
- Past weather features
- pitchforks and hammer handles
- Outlook

Topic: Cold, snowy start to May for some

Several observers reported a very cold start to May. May 1st was the coldest in history for some. The National Weather Service put out a notice that Grand Forks tied their record for coldest daytime temperature on May 1st with a reading of only 34 degrees F. Similarly, Fosston, Thief River Falls, and Wadena reported record maximum values of just 30 degrees F, while McIntosh, MN reported a high of only 26 degrees F. St Cloud reported a record cold maximum temperature value on May 1st of 39 degrees F, while Eau Claire reported a record cold maximum temperature on May 2nd

of just 39 degrees F as well. Embarrass reported overnight lows of just 18 degrees F on both May 3rd and May 4th. All of these readings rival those of the previous coldest start to May back in 1909.

Many observers also reported snowfall on the first two days of May, albeit just a trace. Nevertheless some communities received measurable amounts. Warren (Marshall County) reported 1.3 inches, International Falls 0.4 inches, Twin Valley 0.6 inches, Moorhead 0.7 inches, Brainerd 0.2 inches, and Itasca State Park 0.2 inches. Perhaps these are the last snowfall reports of the spring.

Weekly Weather Potpourri:

NOAA has a comprehensive report out about the historic and tragic tornado outbreak of April 25-26 last week. Preliminary estimates suggest 305 tornadoes, and the National Weather Service issued warnings on over 90 percent of them with an average lead time of 24 minutes. For more statistics and discussion of this outbreak you can go to their web site at...

<http://www.noaa.gov/>

The U.S. Drought Monitor shows that drought across Texas is worsening. In some areas it is the worst drought in 44 years. Their state climatologist reports that on a statewide basis March and April precipitation in 2011 was the driest of record, and April alone was the 5th driest in history. You can read more about this and associated consequences at...

<http://www.chron.com/disp/story.mpl/ap/tx/7552100.html>

Elsewhere the Army Corps of Engineers was blasting levees this week to try to save Cairo, Illinois and other areas from historic flooding on Ohio and Mississippi Rivers. As a result up to 200 square miles of Missouri farmland may be lost to production for the 2011 growing season. You can read more about this matter at...

<http://www.semmissourian.com/story/1724596.html>

The National Weather Service-Louisville, KY Office has put together a comprehensive climatology for the 137 years of the Kentucky Derby horse race. Did you know the Derby race was run in 94 degrees F heat back in 1959? Tomy Lee won that race and must have needed a big drink of water. You can read more at...

http://www.crh.noaa.gov/lmk/?n=historical_kentucky_derby_weather

The Met Office in the United Kingdom announced this week that based on preliminary data April of 2011 was the warmest in history. It was also the 11th driest April in the U.K. climate history. Temperatures averaged 3 to 5 degrees C above average for the month. Tabular data and further narrative can be found at...

<http://www.metoffice.gov.uk/news/releases/archive/2011/dry-april>

MPR listener question: We have heard many stories about farmers coping with a later than normal planting season. What are some other measures of spring showing?

Answer: Well, first of all our most recent memories from last year are of one of the earliest springs in Minnesota history. Earliest ever ice-out dates on many lakes, as well as earliest agricultural planting season in history were major features of the spring in 2010. This year is quite a contrast, but not terribly far off average. For example,

Leech Lake (Cass County) was ice-free on April 6, 2010, this year it finally was ice-free on May 1st (average date is April 27)

Lake Bemidji (Beltrami County) was ice free on April 6, 2010, this year it was ice-free on April 28th (average date is April 26)

You can find other lake ice-out information for the current year and historical dates by going to

http://climate.umn.edu/doc/ice_out/ice_out_status_11.htm

Among other phenological observations: Rhubarb is about a week late this year, and many lilac bushes, as well as aspen and maple trees are budding and leafing out up to a week later in many areas. By this time last year many lawns had already been mowed once. Soil temperatures are only recently suitable for spring planting of corn (above 50 degrees F), running about 1 to 2 weeks behind on the calendar.

Almanac for May 6th:

The average MSP high temperature for this date is 65 degrees F (plus or minus 12 degrees standard deviation), while the average low is 44 degrees F (plus or minus 8 degrees standard deviation).

MSP Local Records for May 6th:

MSP weather records for this date include: highest daily maximum temperature of 89 degrees F in 1896 and 1934; lowest daily maximum temperature of 35 degrees F in 1931; lowest daily minimum temperature of 25 degrees F in 1989; highest daily

minimum temperature of 67 degrees F in 1896; record precipitation of 1.51 inches in 1939; record snowfall of 0.2 inches in 1947.

Average dew point for May 6th is 37 degrees F, with a maximum of 66 degrees F in 1965 and a minimum of 14 degrees F in 1989.

All-time state records for May 6th:

Scanning the state climatic data base: the all-time high for this date is 98 degrees F at Grand Meadow (Mower County) in 1934; the all-time low is 12 degrees F at Alborn (St Louis County) in 1944. The all-time record precipitation amount for this date is 3.48 inches at Minneota (Lyon County) in 1983. The state record daily snowfall for this date is 10.0 inches at Roseau (Roseau County) in 1938.

Past Weather Features:

Heat, drought, and dust storms visiting the state in May of 1934. On May 6th at least 12 Minnesota cities reported a high of 90 degrees F or greater. At Fairmont it was the start of a 4-day heat wave, with each day reaching above 90 degrees F. The Fairmont observer recorded 14 days of 90 degrees F or warmer that may, topped by 108 degrees F on the 31st.

The first week of May in 1938 brought significant snowfalls to many Minnesota communities. Windom reported 12 inches, while far to the north Roseau reported 10 inches. Elsewhere Worthington and Winnebago received 6 inches, Fosston 9 inches, and Park Rapids 8 inches. It was the wettest May in state history as well, with a statewide average precipitation of nearly 6.25 inches. The observer at St Cloud reported 24 rainy days during the month.

On May 5, 1976 the observer in Milan, MN reported rainfall of 0.05 inches. Little did he know that was going to be the biggest rainfall of the month. Indeed, May of 1976 was one of the driest in state history. Many western Minnesota communities including Tyler, Milan, and Benson reported less than a quarter of an inch of rainfall for the month.

Word of the Week: pitchforks and hammer handles

Once upon a time in an older American culture these words were used to describe a very heavy rain, a dangerous rain where you would not want to be caught outside. "It's raining pitchforks and hammer handles" would certainly evoke a cautious attitude about going outside. Indeed few of us ever see it rain that hard but may be once or twice in a lifetime.

Outlook:

An unsettled period going into the weekend and early next week with frequent chances for precipitation and temperatures near seasonal normals, perhaps a bit warmer. A drier period is in store towards the end of next week by Thursday and Friday.

Further Information:

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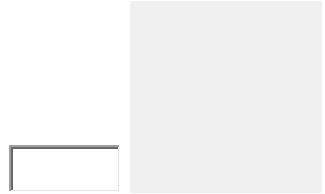
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Minnesota WeatherTalk Newsletter for Friday, May 13, 2011

To: MPR Morning Edition Crew
From: Mark Seeley, University of Minnesota Extension
Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, May 13, 2011

Headlines:

- Dewpoint records set on May 10th
- Weekly Weather Potpourri
- MPR listener question
- Almanac for May 13th
- Past weather features
- Travado
- Outlook

Topic: High Dewpoint Records for May

Tuesday, May 10th was quite a day in Minnesota. During the afternoon strong southeast winds brought in very warm, moist air across southern counties. Many observers reported near-record setting or record setting temperatures in the 90s F, spiking between 4:00 and 6:00 pm. Some of the record-setters included:

Waseca 92 F (tied record for May 10th in 1987)

Wells, St James, and Fairmont 93 F

Amboy and Winnebago 96 F

The readings at Amboy and Winnebago were just shy of the all-time state record for May 10th of 97 degrees F at Beardsley in 1928.

Even more impressive than these high temperatures was the rise in dewpoints. Many observers reported record high dewpoints by late afternoon, including MSP International Airport which reached a July-like 70 degrees F. Windom, Fairmont, St James, and Faribault also reported dewpoints of 70 degrees F. Even higher dewpoints occurred at Hutchinson (73 F), Albert Lea (74 F) and Waseca (78 F). These numbers are incredible amounts of water vapor for the first half of May. In some cases they pushed the Heat Index Value (combination effect of temperature and dewpoint) to 100 degrees F or higher. It is believed that the Waseca dewpoint of 78 degrees F is the highest ever measured in the month of May. In the MSP historical records dewpoints of 70 degrees F or higher during the first half of May have only been reached in 1912, 1916, and 1962.

The dramatic rise in temperature and dewpoint helped fuel severe weather across the state. There were over 40 reports of large hail during the evening of May 10th including 2.0 inch diameter hail stones at Chanhassen, Eden Prairie, Forest Lake, and Brainerd. Golden Valley, St Louis Park, and Fort Ripley reported 2.5 inch diameter hail, and Albertville reported 2.75 inch diameter hail.

The season's first tornado was reported near St Michael (Wright County) at two minutes before 8:00 pm on the evening of May 10th, and there was a flash flood report near Milaca in central Minnesota. The Twins baseball game at Target Field against the Tigers was suspended for a time due to severe weather (lightning, hail). Hail had to be cleared from the field using rakes and leaf blowers before the game could resume.

Weekly Weather Potpourri:

Spring flood crests continue to be observed along the Mississippi River from TN south through LA. Flood crests have already displaced and disrupted citizens in many major cities, including Memphis. This weekend the Morganza Floodway in Louisiana may be opened, flooding millions of acres in cropland in order to protect the cities of Baton Rouge and New Orleans from Mississippi River flood waters. You can read more about this at...

<http://www.mvn.usace.army.mil/bcarre/morganza.asp>

Meanwhile Manitoba officials are still trying to decide whether or not to breach the Hoop and Holler Dike along the Assiniboine River in order to relieve flood threats downstream that would affect hundreds of homes. This has had to be done historically on a few occasions when spring snow melt flooding has been extreme. Some parts of Manitoba had over 60 inches of snowfall this winter.

Severe sandstorms moved across parts of northern China on Wednesday and Thursday this week, yellowing the sky and causing air quality alerts to be issued. Some airports were closed and traffic was disrupted by low visibility. Rainfall was expected to clear the air by the weekend.

MPR listener question: On occasion northern lakes are still ice covered for the Fishing Opener the second weekend in May. Are there any still ice-covered this year as we head into the Opener on Saturday (May 14)?

Answer: Very few. Nearly all areas of the state report ice-free lakes this week, except for some in the northeast. Several lakes in Cook County still report ice, including Sawbill, Devil Track, Mountain, and Trout Lakes. Gunflint Lake reported ice-out on Tuesday of this week. A climate history of the Governor's Fishing Opener is available at the National Weather Service Duluth Office web site....

<http://www.crh.noaa.gov/dlh/>

Incidentally, this Saturday's Fishing Opener looks to have a chance for showers with daytime highs in the 40s and 50s F.

Almanac for May 13th:

The average MSP high temperature for this date is 67 degrees F (plus or minus 11 degrees standard deviation), while the average low is 46 degrees F (plus or minus 7 degrees standard deviation).

MSP Local Records for May 13th:

MSP weather records for this date include: highest daily maximum temperature of 92 degrees F in 2007; lowest daily maximum temperature of 44 degrees F in 1966; lowest daily minimum temperature of 29 degrees F in 1888 and 1953; highest daily minimum temperature of 68 degrees F in 1900; record precipitation of 0.98 inches in 1962; record snowfall of a trace in 1935 and 1902.

Average dew point for May 13th is 42 degrees F, with a maximum of 72 degrees F in 1962 and a minimum of 10 degrees F in 1989.

All-time state records for May 13th:

Scanning the state climatic data base: the all-time high for this date is 95 degrees F at Beardsley (Big Stone County) and Moorhead (Clay County) in 1894, at Campbell (Wilkin County) in 1932, and at Rothsay (Wilkin County) in 1977; the all-time low is 10 degrees F at Tower (St Louis County) in 1997. The all-time record precipitation amount for this date is 4.63 inches at Saint Francis (Anoka County) in 1999. The state record daily snowfall for this date is 3.0 inches at Bagley (Clearwater County) in 1907, at Argyle (Marshall County) in 1924, and at Lutsen Mountain (Cook County) in 1997.

Past Weather Features:

On May 13, 1872 a severe storm over Sibley County dropped hail stones as big as pigeon eggs. Lightning struck and burned down a barn in Sibley killing a horse inside. Historically speaking peak hail season is two weeks either side of June 1st in Minnesota.

May 13, 1894 brought temperatures in the 90s F to many western Minnesota communities. A May heat wave lasted through much of the second week of the month, bringing some heavy thunderstorms. Few farmers knew that the balance of the growing season would lead to drought.

May 13, 1942 brought three tornadoes to Minnesota. The first one, an F-3 (winds 158-206 mph) touched down just after noon north of Springfield and marched for 27 miles across portions of Brown, Redwood, and Renville Counties. It destroyed many farm buildings, along with five homes in Morton, where 19 people were injured. The second tornado, an F-2 (winds 113-157 mph), touched down at a quarter past two in the afternoon in Wright County, traveled four miles and lifted back into the cloud base before reaching Elk River. The third tornado, an F-3, traveled 6 miles across Hennepin and Anoka Counties. It touched down west of Anoka and moved toward Dayton, destroying portions of four farms and one home, which was lifted off its foundation and dropped back to the ground.

Word of the Week: Travado

This word has Portuguese origins, past participle of travar (to twist), but it is a descriptive term for a violent, sudden storm that brings wind and rain, sometimes even a tornado. It may still be used in forecasting weather around the Mediterranean.

Outlook:

Possible occasional showers on Saturday for the Fishing Opener, with cooler temperatures. Highs in the 40s and 50s F. Partly cloudy on Sunday and Monday with a warming trend. Generally dry weather Tuesday through Thursday may allow Minnesota farmers to try to catch up on spring planting activity.

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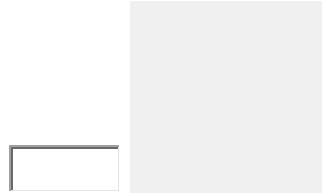
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Minnesota WeatherTalk Newsletter for Friday, May 20, 2011

To: MPR Morning Edition Crew
From: Mark Seeley, University of Minnesota Extension
Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, May 20, 2011

Headlines:

- A great week for farmers
- New Seasonal Climate Outlooks
- Cold again at Embarrass
- Weekly Weather Potpourri
- MPR listener question
- Almanac for May 20th
- Past weather features
- smir and smur
- Outlook

Topic: Finally, a weather window for Minnesota farmers

The long winter, prolonged spring flood season, saturated soil conditions, and cooler than normal soil temperatures finally abated significantly this week with a string of ideal, sunny and warm days that allowed Minnesota farmers to make rapid progress in planting crops. Planting acreage on corn, wheat, and sugar beets advanced by leaps

and bounds this week, with the largest fraction of land being planted over a 4-day period, Monday-Thursday.

Average 4-inch soil temperatures rose from the upper 40s F last weekend into the mid-60s F during the week, making the seedbed suitable for rapid germination of planted crops. In addition 4-5 consecutive days without rain and with good drying conditions allowed even the wettest of soils to become workable. Still, for corn this is the latest planting season in well over a decade. There is still a considerable amount of soybean acreage to plant as well.

Topic: New Seasonal Climate Outlooks

The NOAA Climate Prediction Center released new seasonal climate outlooks this week. For Minnesota the outlook favors a cooler and wetter than normal month of June. In addition the entire summer period from June through August is expected to be cooler than normal, with equal chances for above or below normal rainfall over that period. The outlooks are based at least partially on recent climate trends and excessive soil moisture across our region.

Topic: Embarrass is cold again

A persistent high pressure ridge, along with clear skies brought several cold mornings this week. Many observers reported morning lows in the 30s F. International Falls started out the morning of the 16th at 29 degrees F and soared all the way to 72 degrees F by afternoon. Up at Embarrass, each morning dropped into the 20s F, then warmed into the 60s F during the day. On May 19th Embarrass reported the coldest temperature in the 48 contiguous states with a reading of 27 degrees F.

Weekly Weather Potpourri:

While much of the Northern Plains and Midwest in the USA has seen a wet and slow start to spring, seriously delaying planting in some areas, Northern Europe may be seeing early signs of drought for their 2011 growing season. Some parts of Europe have seen less than 40 percent of average February through April precipitation. This will definitely hurt the wheat crop, especially in France. Reports indicate some areas are approaching serious drought conditions and water conservation practices are in play. You can read more at...

<http://www.bbc.co.uk/news/world-europe-13440408>

NOAA forecasters are calling for an "above normal" hurricane season in the North Atlantic, Caribbean, and Gulf of Mexico during 2011. They predict 12-18 named

Tropical Storms and the potential for 6-10 hurricanes. The hurricane season runs from June 1 to November 30. One of the factors accounting for this prediction is warmer than normal temperatures in the North Atlantic waters. In addition they are factoring in a La Nina effect since it is not expected to dissipate until the summer. You can read more at...

<http://www.noaa.gov/>

Scientists from Macquarie University in Australia think they have documented a 15 percent rebound in ozone over Antarctica since the advent of the Montreal Protocol in 1989 which restricted emissions of ozone-depleting chemicals. Other scientists express uncertainty about this finding, but certainly the trend appears to be in the right direction. You can read more about this in the current issue of Science (April 2011)

Also in the April issue of Science researchers from Spain document that the summer heat waves of 2010 and 2003 probably broke 500-year old records for heat across much of the European continent. Accelerating climate trends lead to an increased probability of another heat wave similar to that of 2010 occurring during the second half of the 21st Century according to their analysis.

MPR listener question: I saw that earlier this month Embarrass, MN reported a low of just 18 degrees F, but it was not a state record. What is the coldest reading during the month of May on a statewide basis?

Answer: Believe it or not, Pine River in Crow Wing County reported a morning low of just 4 degrees F on May 2, 1909 (the daytime high was only 30 F, also a record). This is understandable in context. The Pine River observer reported nearly a foot of fresh snow over April 28-30, 1909, so the landscape was white going into the month of May that year.

Almanac for May 20th:

The average MSP high temperature for this date is 71 degrees F (plus or minus 10 degrees standard deviation), while the average low is 49 degrees F (plus or minus 8 degrees standard deviation).

MSP Local Records for May 20th:

MSP weather records for this date include: highest daily maximum temperature of 94 degrees F in 2009; lowest daily maximum temperature of 45 degrees F in 1931; lowest daily minimum temperature of 31 degrees F in 1892; highest daily minimum temperature of 66 degrees F in 1972; record precipitation of 1.14 inches in 1937;

record snowfall of a 3.0 inches in 1892, the largest amount ever measured so late in the spring.

Average dew point for May 20th is 46 degrees F, with a maximum of 69 degrees F in 1974 and a minimum of 19 degrees F in 1929.

All-time state records for May 20th:

Scanning the state climatic data base: the all-time high for this date is 101 degrees F at Madison (Lac Qui Parle County) in 2009; the all-time low is 16 degrees F at Embarrass (St Louis County) in 2002. The all-time record precipitation amount for this date is 4.83 inches at Winton (St Louis County) in 1970. The state record daily snowfall for this date is 4.8 inches at Virginia (St Louis County) in 1931.

Past Weather Features:

On May 20, 1876 a tornado struck near Fort Ripley in Crow Wing County and was observed by the soldiers there.

May 20, 1892 was perhaps the most winter-like in history bringing cold, wind, and snow to many Minnesota communities and putting an abrupt halt to the spring planting season. Rain during the night of May 19th turned to snow about 10:30 pm and it snowed off and on until 6:30 am the morning of the 20th with strong northwest winds. Snowfall totals from around the state included:

4.0 inches at Farmington and Maple Plain

3.9 inches at Pokegama Dam

3.5 inches at St Charles

3.0 inches at Minneapolis, Crookston, and Bird Island

2.0 inches at Granite Falls, Montevideo, Red Wing, and Northfield

Morning temperatures were in the 20s and 30s F, with windchill values in the teens. The next day temperatures recovered into the upper 50s to mid 60s F.

A three-day May heat wave occurred across southern and western Minnesota over May 19-21, 2009. Many observers reported daytime highs in the 90s, setting many new records for the date. At Madison, MN (Lac Qui Parle County) a new statewide record for May 20th was set with an afternoon reading of 101 degrees F, breaking the record of 100 degrees F set in 1934.

Words of the Week: Smir and Smur

These 19th Century words were used to describe a very fine rain or drizzle. They were used as both a noun and verb in western Europe. They are hardly used anymore, except occasionally in poetry.

Outlook:

Unsettled and bumpy weekend coming up with chances for showers and thunderstorms everyday into Monday. Gradual cooling of temperatures into next week, but drier by Tuesday and Wednesday.

Further Information:

For older versions of the "Minnesota WeatherTalk" newsletter go to

<http://www.climate.umn.edu/weathertalk/>

For access to other information resources go to

<http://www.climate.umn.edu/Seeley/>

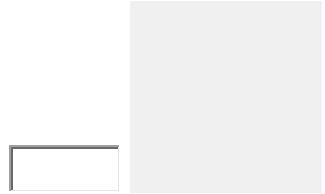
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Minnesota WeatherTalk Newsletter for Friday, May 27, 2011

To: MPR Morning Edition Crew
From: Mark Seeley, University of Minnesota Extension
Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, May 27, 2011

Headlines:

- Preliminary May climate summary
- Weather and the construction industry
- Late planting season challenge
- Weekly Weather Potpourri
- MPR listener question
- Almanac for May 27th
- Past weather features
- Barber Pole
- Outlook

The World Meteorological Organization reported the world's hottest temperature this week was 121 degrees F at Jacobabad, Pakistan, while the coldest reading was -105 degrees F at Vostok in Antarctica.

Topic: Preliminary climate summary for May 2011

Mean monthly temperatures for May ranged from 1 to 2 degrees F cooler than normal for most Minnesota observers. Extremes were 18 degrees F at Embarrass on May 3 and 96 degrees F at Winnebago on May 10th, which was a record for the date.

Widespread frosts occurred over May 1-4, and for some in central and northern counties again on over May 16-18, and May 26-27. Embarrass reported the nation's lowest temperature at 25 degrees F on May 26th. Then on Friday, May 27th Hibbing, Grand Portage, and Orr reported lows of 26 degrees F. This was the 5th consecutive month with a cooler than normal statewide average temperature.

Many observers reported above normal rainfall for May, and some had rain on 15 or more days during the month. Those receiving 5 or more inches include Mora, Milaca, Forest Lake, Rockford, Kimball, Redwood Falls, Lanesboro, and Pipestone. Buffalo reported nearly 7 inches of rainfall for the month. For many central Minnesota communities May of 2011 ranks among the wettest historically, and has caused delayed planting of agricultural crops.

Topic: Weather and the Construction Industry

We are in the midst of the peak construction season for Minnesota. Weather and climate information are used a great deal by the construction industry. Climatic data are used to estimate probable working days for construction projects, including likelihood of rainfall disruptions. Downtime or lost working days due to weather are often the basis for amending contracts, particularly time schedules for the completion of various construction phases. Many specific activities are weather sensitive: pouring and curing of concrete, roofing (shingles or tiles), brickwork, paving, excavating, painting, and of course re-landscaping disturbed work sites. In addition to rainfall climatology and precipitation forecasting, wind forecasting can be very important, particularly to sites where tall structures are being erected and they are storing or moving around materials like sheeting, shingles, duct work, insulation, tiles, sheet rock and other things which can be caught up by the wind. In Minnesota, like most other states, private meteorologists often provide construction companies with custom forecasts for specific sites and projects. These generally prove to be a valuable investment, especially for long projects which require several months or years to complete (e.g. the light rail project between Minneapolis and St Paul).

Topic: Late planting season a challenge

Though farmers made very good progress last week on corn planting (now over 80 percent planted), weekend rainfall brought a halt to field work earlier this week. Minnesota farmers may be using crop insurance for delayed plantings, choosing earlier relative maturity corn seed for their remaining acreage, or perhaps even considering a switch to soybeans as they try to cope with this late planting season. A

good deal of information relative to crop insurance and decisions about late planted crops can be found on the University of Minnesota Extension web site for those interested.....

<http://www.extension.umn.edu/agriculture/crops/late-planting/>

Weekly Weather Potpourri:

Following a record number of tornadoes across the USA in April, May had started out relatively quiet through the 20th. But starting last weekend severe weather activity increased dramatically across the nation, and the NOAA Storm Prediction Center now reports well over 270 so far this month. Since last Saturday there have been over 260 tornado reports filed, including at least 5 from Minnesota on Sunday May 22nd. Minnesota counties filing tornado reports included Hennepin, Anoka, Chisago, Washington, Fillmore, and Houston Counties. The most tragic event was the powerful tornado that hit Joplin, MO on the 22nd, killing 122 people and causing injuries to over 700, with widespread damage throughout the city. You can read more from NOAA-SPC at...

http://www.spc.noaa.gov/climo/reports/110522_rpts.html

NASA scientists reported this week that the TRMM satellite system for measuring rainfall rates detected a rate of 2 inches/hour from the thunderstorm complex that approached Joplin, MO on Sunday (May 22) and spawned a monster tornado. This is an extreme rate of rainfall detected from a Midwest thunderstorm system and pretty rare in frequency. You can read more at...

<http://www.sciencedaily.com/releases/2011/05/110525112115.htm>

In the Western North Pacific Ocean Songda, rated a Super Typhoon at one time this week was churning east of the Philippines with winds of 140-150 mph and gusts over 170 mph. This strong storm was producing wave heights near 40 feet. Songda skirted past the northern Philippines and head toward southern Japan over the weekend. However it produced rainfall rates of over 1 inch per hour for a time and caused some flash flooding and landslides in parts of the Philippines.

Researchers from Montana State University reported this week that they found high concentrations of bacteria in the cores of large hail stones. They argue that this is evidence for an important role of airborne biological organisms in the hydrologic cycle, as they provide a nucleus for condensation of water vapor. You can read more from their report at...

<http://www.sciencedaily.com/releases/2011/05/110524111345.htm>

The latest advisory from the British Met Office suggests that the ash plume from the Grimsvotn volcano in Iceland has dissipated, though a good deal of steam is still being admitted. The advisory suggests that there will be little disruption to air traffic over western Europe.

MPR listener question: I know that historically frost has occurred over Memorial weekend, especially in northern Minnesota, but has measurable snowfall ever occurred?

Answer: I cannot find a record of snowfall on Memorial Day in the Twin Cities area. However there is documentation of snowfall in other communities. Bemidji reported snowfall (0.1 inches) on May 30, 1897, while New Ulm, Mankato, and Waseca reported about an inch of snowfall on Memorial Day (May 25) in 1992.

Almanac for May 27th:

The average MSP high temperature for this date is 71 degrees F (plus or minus 9 degrees standard deviation), while the average low is 52 degrees F (plus or minus 8 degrees standard deviation).

MSP Local Records for May 27th:

MSP weather records for this date include: highest daily maximum temperature of 95 degrees F in 1969; lowest daily maximum temperature of 44 degrees F in 1965; lowest daily minimum temperature of 34 degrees F in 1907; highest daily minimum temperature of 70 degrees F in 1969; record precipitation of 2.17 inches in 1978; record snowfall on this date is a trace in 1965 and 1991.

Average dew point for May 27th is 48 degrees F, with a maximum of 69 degrees F in 1969 and a minimum of 25 degrees F in 1917.

All-time state records for May 27th:

Scanning the state climatic data base: the all-time high for this date is 104 degrees F at Hallock (Kittson County) in 1934; the all-time low is 13 degrees F at Sandy Lake Dam (Aitkin County) in 1895. The all-time record precipitation amount for this date is 3.90 inches at Mahnomen (Mahnomen County) in 1963. The state record daily snowfall for this date is 5.0 inches at Virginia (St Louis County) in 1932.

Past Weather Features:

A late May heat wave dominated Minnesota weather over May 26-29, 1874. Four consecutive days with daytime highs in the 90s F made it feel like mid-July. The Signal Corps Office in downtown St Paul hit 94 degrees F on the 27th, while Fort Ripley reported a high of 96 degrees F.

On May 27, 1931 between 4:00 and 5:00 pm an F-3 tornado (winds 158-206 mph) passed across Clay and Norman Counties in northwestern Minnesota. This tornado killed two people and injured 57. It struck the Empire Builder train as it was moving along at 55 mph near Sabin, MN and lifted it from the tracks. It also damaged over a dozen homes near Moorhead.

On May 27, 1980 strong thunderstorms visited southwestern Minnesota bringing a record-setting 3.42 inches of rainfall to Lamberton and 2.37 inches of rainfall at Tracy. That storm remains the great single day rainfall ever observed in May at Lamberton, MN.

Words of the Week: barber pole

A tall vertical cloud associated with thunderstorms which takes on the appearance of a twisted pole, looking like those in front of a barber shop. It is indicative of a strong rotating updraft and great instability aloft.

Outlook:

Unsettled weekend with chances for showers each day, though Sunday should bring some breaks in the clouds and at least a dry period during the day. Continued chance of showers Monday with warmer temperatures. Chance of showers early Tuesday in the east, then drier and a warming trend towards Friday with another chance of showers near the end of the week.

Further Information:

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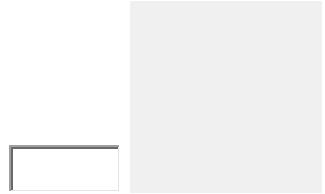
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Minnesota WeatherTalk Newsletter for Friday, June 3, 2011

To: MPR Morning Edition Crew
From: Mark Seeley, University of Minnesota Extension
Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, June 3, 2011

Headlines:

- Windy and stormy close to May
- Cold start for June up north
- Weekly Weather Potpourri
- MPR listener question
- Almanac for June 3rd
- Past weather features
- Flaught
- Outlook

Topic: Windy and stormy close of May

When we chatted on Morning Edition last Friday (May 27th) we thought most of the significant weather events for the month were behind us. We were wrong as Mother Nature had a few cards to play during the Memorial Weekend period.

The end of May brought high winds, hail, and tornadoes to Minnesota. On Saturday, May 28th strong winds and hail were reported around the state. Up to one and three-quarter inch hail was observed in Sibley County, while one inch hail was reported from Lake of the Woods County as well. A very rare EF-0 tornado (winds 65-85 mph)

was observed near Wales, west of Silver Bay in Lake County. It uprooted and topped many trees. That area of the state has reported very few tornadoes historically. On Sunday, May 29th, in Lincoln and Brown counties (SW MN), 1-2 inch diameter hail was reported. Then on Memorial Day (May 30) up to 2 inch diameter hail was reported from Goodhue County and strong thunderstorm winds were recorded in several other counties. Crow Wing, Clay, Polk, and Norman Counties reported winds over 60 mph. A semi-truck trailer was overturned along Interstate 94 near Moorhead. Later in the evening a microburst and EF-1 tornado (winds 85-105 mph) damaged some buildings near Park Rapids, the Grandstand at the Hubbard County Fairgrounds and some docks and pontoon boats on Fish Hook Lake. The strong low pressure system associated with these thunderstorms passed to the north of the state over Tuesday, May 31st and continued to bring very high winds to many areas of the state. Winds of 40 mph per hour were common in most communities, dislodging small branches and blowing trash cans around. Alexandria, Starbuck, Sauk Center, Fargo-Moorhead, and Appleton reported winds over 50 mph.

Under the strong southerly winds over May 30-31 dewpoints climbed into the 70s F, very high values for May. The dewpoint of 70 F at MSP International Airport was just two degrees below the all-time record for May 30th.

Topic: Cold start to June up north

Once the winds shifted and came from the north this week, sky conditions cleared and overnight lows plummeted up north. Over the first two days of June International Falls, Ely, and Hibbing reported overnight lows of 36 degrees F, while Orr was just 34 degrees F. Crane Lake reported 28 degrees F and Embarrass 26 degrees F for the lowest readings in the state to start June.

Weekly Weather Potpourri:

The NOAA Storm Prediction Center documented over 350 tornado reports nation wide during May, and reported 20 on the first day of June. Around Springfield, MA was especially hard hit. National Weather Service personnel were still assessing the strength of the tornadoes that struck. Manitoba residents reported some severe thunderstorms on Thursday, June 2nd as well, with heavy rain and hail.

Over 50 wildfires were reported across southeastern Russia this week where the landscape suffered through prolonged dryness during 2010. The fires are visible on the NASA-MODIS Earth Observatory web site....

<http://earthobservatory.nasa.gov/NaturalHazards/>

The National Hurricane Center was tracking two tropical low pressure systems this week, one in the Caribbean Sea and the other in the Gulf of Mexico. Both were being monitored for potential to develop into Tropical Storms.

<http://www.nhc.noaa.gov/>

According to the BBC Cuba is reporting one of its worst droughts in 50 years. Some reservoirs used for water supply are dangerously low and water rationing is going on in some communities. The start of the Tropical Storm Season is expected to bring some relief.

A new paper in the Proceedings of the National Academy of Sciences documents the Viking settlements on Greenland between 980 A.D. and 1400 A.D. It describes the rapid cooling of climate, shortening of the growing season, and failure in some of the Viking communities as the climate changed. You can read more at...

<http://www.sciencedaily.com/releases/2011/05/110530152331.htm>

MPR listener question: With the added rainfall and storms over the Memorial Weekend where were the wettest places in the state during May of 2011?

Answer: Looks like Andover reported the greatest amount rainfall for the month at 8.64 inches. Buffalo reported 7.97 inches the wettest May in their records going back to 1940. Milaca reported 7.51 inches in May, 3rd highest for the month going back to 1897, and Mora reported 7.21 inches, 4th highest May total going back to 1904.

Almanac for June 3rd:

The average MSP high temperature for this date is 76 degrees F (plus or minus 9 degrees standard deviation), while the average low is 54 degrees F (plus or minus 7 degrees standard deviation).

MSP Local Records for June 3rd:

MSP weather records for this date include: highest daily maximum temperature of 92 degrees F in 1923; lowest daily maximum temperature of 53 degrees F in 1897 and 1990; lowest daily minimum temperature of 34 degrees F in 1945; highest daily minimum temperature of 73 degrees F in 1944; record precipitation of 1.71 inches in 1914; no measurable snowfall has been recorded on this date.

Average dew point for June 3rd is 49 degrees F, with a maximum of 73 degrees F in 1963 and a minimum of 24 degrees F in 1929.

All-time state records for June 3rd:

Scanning the state climatic data base: the all-time high for this date is 98 degrees F at Canby (Yellow Medicine County) in 1940 and at Lamberton, Madison, Montevideo, and Springfield in 1968; the all-time low is 19 degrees F at Ely (St Louis County) in 1947. The all-time record precipitation amount for this date is 7.10 inches at Pine River (Cass County) in 1898. No measurable snowfall on this date in Minnesota.

Past Weather Features:

About 7:00 pm on June 3, 1880 an F-3 tornado (winds 158-206 mph) traveled between Currie and Shetek in Murray County, a distance of about 5 miles. It destroyed or damaged several homes and farm buildings, and picked up a one-room school house carried it for nearly a quarter mile, then smashed it against the ground. There were no deaths, but 10 injuries.

In the late afternoon of June 3, 1955 seven people were drowned on Lake Traverse when their boat was overturned by strong thunderstorm winds.

A nearly week-long heat wave over June 3-8, 1968 brought 90s F to over 40 Minnesota communities, mostly in the western sections of the state. Springfield had back to back days with 98 and 99 degrees F, while Lamberton had consecutive days of 98, 100, and 98 degrees F. Strong thunderstorms by June 9th brought an end to the heat wave and temperatures settled into the 70s and 80s F for the rest of the month.

Word of the Week: Flaught

This word refers to a sudden burst of wind and rain. This was a prevalent feature of our weather over the past week in Minnesota.

Outlook:

Seasonably warm and mostly dry over the weekend and into Monday. Then a chance for showers again by Tuesday with cooler temperatures the remaining part of the week.

Further Information:

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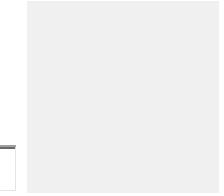
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(EARLY EDITION) Minnesota WeatherTalk Newsletter for Friday, June 10, 2011

To: MPR Morning Edition Crew

From: Mark Seeley, University of Minnesota Extension

Dept of Soil, Water, and Climate

Subject: (EARLY EDITION) Minnesota WeatherTalk Newsletter for Friday, June 10, 2011

Headlines:

- June Heat
- Weekly Weather Potpourri
- MPR listener question
- Almanac for June 10th
- Past weather features
- Heat cramps
- Outlook

Topic: June Heat

Last Friday, June 3rd brought record heat to some southern Minnesota communities. The following were new record highs for June 3rd: 93 degrees F at La Crescent and Amboy, 96 degrees F at Rochester, Waseca, Albert Lea, and Austin. It was short-lived as temperatures fell off into the 70s and 80s F for the weekend.

But on Monday, June 6th the heat returned for a longer stay in Minnesota. Many new record high temperatures were reported, including 97 degrees F at MSP International Airport and at Rochester, 99 degrees F at Windom, Worthington, and Austin, and 100 degrees F at Redwood Falls, Marshall, and Luverne. The statewide record of 106 degrees F at Pipestone in 1933 remained intact.

The National Weather Service issued Heat Advisories for June 6-7 as Heat Index Values were expected to approach or exceed 100 degrees F during the day and remain above 75 degrees F at night.

On Tuesday, June 7, more new record high temperature values were reported. It was arguably the hottest June 7th in state history, as many locations broke the statewide record high temperature of 100 degrees F (at Lamberton and Madison in 1987). Among those breaking the century mark were Red Wind, MSP, South St Paul, Rochester, Mankato, Owatonna, Blue Earth, Faribault, Mankato, St Peter, St Cloud, Collegeville, Gaylord, and New Prague. The 103 degrees F recorded at MSP will probably stand as the new state record for June 7th. It was the first time the Twin Cities has reached 103 degrees F in the month of June since 1934.

Weekly Weather Potpourri:

A tropical depression off the west coast of Mexico was expected to develop into a hurricane later this week, the first of the season in the Eastern Pacific Ocean. It is expected to remain out to sea and not track across Mexico.

www.nhc.noaa.gov

Haiti was hit by heavy tropical rains this week which caused widespread flooding and killed up to 11 people. More heavy rainfall was expected later this week.

<http://www.bbc.co.uk/news/world-latin-america-13689711>

A recent NCAR paper documents how urban development can damper wind speeds throughout cities and cause higher build up of pollutants there. This study used findings in the Houston, TX area to assess how development affects heat storage and wind patterns that tend to disperse pollutants out of the city. You can read more at...

<http://www.sciencedaily.com/releases/2011/06/110607121137.htm>

MPR listener question: How do the extreme temperature ranges for the summer months compare in Minnesota? Which month exhibits the highest range in temperature?

Answer: The all-time June temperature extremes are: 110 degrees F at Canby on 6/29/1031 and 15 degrees F at Bigfork on 6/1/1964 (a range of 95 degrees F); the all-time July extremes are 114 degrees F at Moorhead on 7/6/1936 and at Beardsley on 7/29/1917, and 24 degrees F at Tower on 7/7/1988 (a range of 91 degrees F); the all-time August temperature extremes are 110 degrees F at Montevideo on 8/1/1988 and at Beardsley on 8/10/1947, and 21 degrees F at Kelliher on 8/2/2002, and at Tower on 8/28/1986 (a range of 89 degrees F). So June the month with the longest daylength also has the highest range in temperature of the summer months.

Almanac for June 10th:

The average MSP high temperature for this date is 76 degrees F (plus or minus 9 degrees standard deviation), while the average low is 57 degrees F (plus or minus 7 degrees standard deviation).

MSP Local Records for June 10th:

MSP weather records for this date include: highest daily maximum temperature of 99 degrees F in 1956; lowest daily maximum temperature of 56 degrees F in 1945; lowest daily minimum temperature of 40 degrees F in 1877; highest daily minimum temperature of 73 degrees F in 1973; record precipitation of 1.77 inches in 1874; no measurable snowfall has been recorded on this date.

Average dew point for June 10th is 53 degrees F, with a maximum of 72 degrees F in 1918 and a minimum of 20 degrees F in 1972.

All-time state records for June 10th:

Scanning the state climatic data base: the all-time high for this date is 106 degrees F at Fairmont (Martin County) in 1933; the all-time low is 22 degrees F at Remer (Cass County) in 1985 . The all-time record precipitation amount for this date is 6.05 inches at Agassiz Refuge (Marshall County) in 2002. No measurable snowfall on this date in Minnesota.

Past Weather Features:

On June 10, 1897 between 2:00 pm and 7:00 pm an outbreak of severe weather brought five tornadoes to Minnesota. The first occurred near Willmar in Kandiyohi County, doing some damage to a farm. The second one occurred at 4:00 pm near Alden in Freeborn County where several farms were destroyed. A third tornado about 4:30 pm cut a zig-zag path across Waseca and Blue Earth Counties, damaging several farms along a 15 mile path. At 5:30 pm a small tornado formed near Glenville in

Freeborn County but did little damage. The most destructive tornado, an F-4 (winds over 206 mph) passed six miles across Freeborn and Mower Counties damaging about 20 farms just north of the Iowa border, and killing three people.

June 8-9, 1985 brought a heat wave to many parts of Minnesota. Dozens of communities reported daytime highs in the 90s F, while at least 8 communities hit the 100 degrees F mark or higher. After reporting a high temperature of 102 degrees F on June 9th, the Faribault observer reported a strong cold front that dropped the temperature to just 47 degrees F on June 10th.

Over June 9-10, 2002 one of the heaviest thunderstorms to ever hit northwestern Minnesota passed across Roseau and Lake of the Woods Counties. The heavy rain started before midnight, and continued for much of the night and early morning hours. Many areas reported over 7 inches of rainfall, and one observer in Lake of the Woods County reported over 14 inches. The streets and properties in the city of Roseau were flooded by this rain storm.

Words of the Week: Heat cramps

This term refers to spasms or contractions in muscles of the abdomen, arms, or legs due to exercise and dehydration in hot weather. Sometimes they can be disabling and the person must cool down, and rehydrate with water, juice, or sports drinks before resuming activity. Heat cramps can afflict almost any ages, especially in weather that we had this week.

Outlook:

Cooler than normal temperatures to start the weekend. Increasing chances for showers late Sunday and into Monday. Warmer Monday and Tuesday with a chance for thunderstorms.

Further Information:

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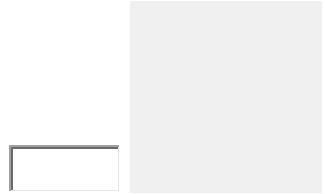
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Minnesota WeatherTalk Newsletter for Friday, June 17, 2011

To: MPR Morning Edition Crew
From: Mark Seeley, University of Minnesota Extension
Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, June 17, 2011

Headlines:

- Record rainfalls
- New seasonal climate outlook
- Weekly Weather Potpourri
- MPR listener question
- Almanac for June 17th
- Past weather features
- weatherboard
- Outlook

Topic: Record rainfalls for some on June 14-15

June 14-15 brought some significant rainfalls to portions of southern Minnesota. Many observers reported 1-2 inches of rainfall, some coming in heavy thunderstorms. Those setting new rainfall records for the date included:

- 2.40 inches at Mankato
- 2.29 inches at Springfield
- 2.11 inches at Waseca

1.89 inches at Pipestone
2.09 inches at Dodge Center
1.98 inches at Faribault
2.60 inches at Wells
2.79 inches at Luverne
4.42 inches at Lamberton
4.65 inches at Slayton
4.84 inches at Tracy

The rainfall amounts at Lamberton, Slayton, and Tracy, were all-time daily rainfall totals. Several others reported over 2 inches of rain including Blue Earth, Windom, and Fairmont, but they were not record-setting amounts. In southwestern Minnesota the National Weather Service had to issue some flash flood warnings. Fortunately there were few reports of hail.

Topic: New Seasonal Climate Outlook

The NOAA Climate Prediction Center released a new seasonal outlook on Thursday of this week. It calls for cooler than normal conditions over the western half of Minnesota during the July through September period. Similarly the western half of the state is expected to see wetter than normal conditions prevail as well.

Weekly Weather Potpourri:

Weather for Grandma's Marathon between Two Harbors and Duluth this weekend should be good, with dewpoints in the 40s F and temperatures in the 50s F. There will be a moderate northeast wind with chances for rain by afternoon. Such conditions may lead to faster running times.

A NOAA weather observation near Big Bend National Park in Texas this week reported an afternoon relative humidity of just 2 percent, thought by many to be the lowest observed humidity in the NOAA monitoring system. Certainly the widespread dryness across TX, NM, and AZ had produced not only low humidity values but high fire danger as well.

NOAA scientists predict that the hypoxic (deadzone) area in the Gulf of Mexico may reach record size this year because of the volume of discharge from the flooded Mississippi River. The large quantity of nutrients carried by the river amplifies the hypoxic area which is estimated to exceed 9400 square miles later this summer. You can read more from NOAA at...

http://www.noaanews.noaa.gov/stories2011/20110614_deadzone.html

So far over 16,000 people have taken the Open Air Laboratories (OPAL) weather survey in the United Kingdom. This survey is designed to look at ways we affect climate and how climate affects us. A summary of the final results will be supplied by the UK Met Office. You can read more about this survey at...

<http://www.metoffice.gov.uk/news/releases/archive/2011/first-climate-survey-results>

MPR listener question: You mentioned last week that the 103 degrees F reported at MSP on June 7th was a new all-time state record. Is that the only all-time state high temperature record held by the Twin Cities? I cannot find others in your book.

Answer: State record high and low temperature values are sometimes tricky in that the record values for individual dates are often shared by different weather stations. Throughout the Minnesota records suburban climate stations like Stillwater, Forest Lake, Chaska, and Maple Plain hold all-time records or may be tied with other locations. For example, Maple Plain holds the all-time high temperature record for the month of May in Minnesota (112 degrees F on May 31, 1934). For the date of March 29, Gaylord, Stillwater and MSP are tied for the record high with 83 degrees in 1986. But reviewing all of the temperature values for June 7th, 2011 I find that the 103 degrees F at MSP International Airport is an all-time state record high for the date and the only such record held exclusively by MSP. So that was quite a unique reading.

Almanac for June 17th:

The average MSP high temperature for this date is 78 degrees F (plus or minus 8 degrees standard deviation), while the average low is 59 degrees F (plus or minus 7 degrees standard deviation).

MSP Local Records for June 17th:

MSP weather records for this date include: highest daily maximum temperature of 97 degrees F in 1933; lowest daily maximum temperature of 54 degrees F in 1876; lowest daily minimum temperature of 42 degrees F in 1960; highest daily minimum temperature of 75 degrees F in 1921; record precipitation of 1.72 inches in 1883; no measurable snowfall has been recorded on this date.

Average dew point for June 17th is 56 degrees F, with a maximum of 74 degrees F in 1944 and a minimum of 39 degrees F in 1958.

All-time state records for June 17th:

Scanning the state climatic data base: the all-time high for this date is 101 degrees F at Milan (Chippewa County) in 1933; the all-time low is 22 degrees F at Tower (St Louis County) in 2000. The all-time record precipitation amount for this date is 8.67 inches at Minneota (Lyon County) in 1957. No measurable snowfall on this date in Minnesota.

Past Weather Features:

June 17-18, 1876 brought some cold June weather to Minnesota. A cold rain fell on the 17th and temperatures barely climbed into the 50s F. Overnight lows ranged from just 36 degrees F at Duluth to 39 degrees F in downtown St Paul. A week later the daytime temperatures soared back into the 90s F.

A historic heat wave gripped Minnesota over June 15-19, 1933. At least 18 Minnesota communities reported daytime temperatures of 100 degrees F or more, topped by 108 degrees F at Beardsley on the 19th. It turned out that June 1933 was the warmest in state history averaging nearly 8 degrees F above normal.

June 16-17, 1957 brought heavy thunderstorms to southern Minnesota. Montevideo, New London, and Willmar reported over 7 inches of rainfall, while Marshall, Tyler, and Minneota reported over 8 inches. Many roads in the Marshall area were washed out and there was extensive crop damage in many areas. Marshall reported a record 13.83 inches of rainfall that month.

On June 17, 2010 a record outbreak of tornadoes occurred in Minnesota with 48 confirmed reports. Average lead time for warnings was 19 minutes as the National Weather Service Forecast Office was continuously busy with severe weather warnings that day from roughly 3:00 pm until 11:00 pm. You can read more about that outbreak from the MPX NOAA web site...

<http://www.crh.noaa.gov/mpx/>

Words of the Week: Weatherboard

This is a nautical term to refer to the windward side of a vessel that is absorbing the energy from the wind and therefore taking the weather directly.

Outlook:

Temperatures close to seasonal normals Saturday through Wednesday with chances for showers and thunderstorms in eastern sections over the weekend. Heavy rains with

stronger thunderstorms are possible in southwestern and south-central Minnesota on Monday and Tuesday, then drier by Wednesday next week.

Further Information:

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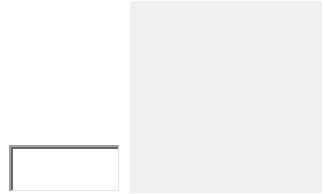
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Minnesota WeatherTalk Newsletter for Friday, June 24, 2011

To: MPR Morning Edition Crew
From: Mark Seeley, University of Minnesota Extension
Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, June 24, 2011

Headlines:

- Rainfall abundant
- St Anthony Park Garden Tour
- Weekly Weather Potpourri
- MPR listener question
- Almanac for June 24th
- Past weather features
- Anemophobia
- Outlook

Topic: Rainfall is abundant and persistent

Some of our Minnesota observers have reported rainfall on 13-14 days so far this month. In addition many are reporting above normal amounts, ranging from 5 to 7 inches. Among those reporting June rainfall of 5 inches or greater:

Blue Earth 5.80" Faribault 7.82" Lake City 7.83"
La Crescent 7.01" Theilman 6.55" Ortonville 5.34"
Worthington 5.36" Fairmont 5.37" Hastings 5.54"

Following a wetter than normal April and May most soils have had little time to dry out. Consequently farmers are having a difficult time getting equipment into the fields in order to do weed control or supplemental fertilizer applications. Fortunately it looks like a drier and warmer weather pattern may prevail for the conclusion of June, after record rains and cool daytime temperatures this week. MSP tied a record cold maximum temperature with just 63 degrees F on Thursday, June 23rd, while Moose Lake reached a high of only 52 degrees F that same day.

Topic: Annual Garden Tour in St Anthony Park

For those who like to get their gardening and home landscaping ideas by observing what others do, here's your chance. The Annual St Anthony Park Garden Tour is Saturday, June 25, 10:00 am to 4:00 pm, starting from the St Anthony Park Library at Carter Avenue and Como Avenue. This year 15 gardens will be on display and the cost is just \$12 for advance tickets, \$15 on the day of the event. For more information you can go to...

<http://sapcc.org/node/651>

Weekly Weather Potpourri:

Tropical Storm Meari off the east coast of the Philippines was expected to reach Typhoon strength and move near Taipei, then graze southern Japan and head for South Korea over the weekend. It was packing wind gusts of 85-95 mph and wave heights of 20-25 feet. Earlier in the week Hurricane Beatriz had threatened tourism sites along Mexico's Pacific coastline, but it moved further out to sea and dissipated.

A new study to be published in the Bulletin of the American Meteorological Society documents weather impacts on annual U.S. economic activity. Researchers conclude that routine weather events and episodes (rain and temperature anomalies) impact the national economy by as much as \$485 billion dollars annually. They say that more detailed analysis may lead to better use of forecasts in adjusting economic activities in transportation, energy, agriculture, manufacturing, and other weather-sensitive areas. You can read more at....

<http://www.sciencedaily.com/releases/2011/06/110622115322.htm>

Tornadoes near Louisville, KY on Wednesday evening caused some damage to nine barns at the famous Churchill Downs race track. A dormitory and chapel were also damaged by the storms, but fortunately no horses or people were harmed. The NOAA Storm Prediction Center has received nearly 1500 tornado reports so far this year, a record-setting pace.

MPR listener question: We have had 5 consecutive days with rain here in Pipestone County this week. Earlier in the month, over June 10-15 we had 6 consecutive days with rain. This reminds me of all the rain we got in June last year. My cousin who farms near Worthington had 8 consecutive days with rain this month. We are wondering what is the record number of consecutive days with rain here in southwestern Minnesota?

Answer: For the Worthington area 9 consecutive days with rain is the record for the month of June. It rained on 11 consecutive days in May of 1996. For the Pipestone area it rained on 13 consecutive June days just last year.

Almanac for June 24th:

The average MSP high temperature for this date is 80 degrees F (plus or minus 8 degrees standard deviation), while the average low is 60 degrees F (plus or minus 6 degrees standard deviation).

MSP Local Records for June 24th:

MSP weather records for this date include: highest daily maximum temperature of 101 degrees F in 1988; lowest daily maximum temperature of 59 degrees F in 1928; lowest daily minimum temperature of 44 degrees F in 1972; highest daily minimum temperature of 76 degrees F in 1954; record precipitation of 2.36 inches in 1911; no measurable snowfall has been recorded on this date.

Average dew point for June 24th is 57 degrees F, with a maximum of 74 degrees F in 1943 and a minimum of 29 degrees F in 1972.

All-time state records for June 24th:

Scanning the state climatic data base: the all-time high for this date is 106 degrees F at Artichoke Lake (Big Stone County) and Marshall (Lyon County) in 1988; the all-time low is 20 degrees F at Remer (Cass County) in 1985. The all-time record precipitation amount for this date is 7.60 inches at Browns Valley (Traverse County) in 2003. No measurable snowfall on this date in Minnesota.

Past Weather Features:

On June 24, 1988 at least 30 Minnesota communities reported afternoon highs of 100 degrees F or greater. Fortunately temperatures fell back into the 80s F by the 26th and even dropped into the 60s F by June 29th.

Over June 24, 1993 southern Minnesota was experiencing heavy rainfall. Many observers were reporting the third consecutive day with thunderstorms. Fairmont reported 4.68 inches on their way to a monthly total of 14.52 inches, a June record for them.

A tornado struck the city of Buffalo Lake in Renville County during the evening of June 24, 2003, causing a good deal of damage. Portions of Renville, Wright, Hennepin, Chisago, and Sherburne Counties recorded huge rainfalls as well. Elk River reported 8.19 inches of rainfall, while Monticello had 7.50 inches. Those reporting six or more inches included: Brooklyn Park, Plymouth, Buffalo, and North Branch.

Words of the Week: Anemophobia

This word refers to a chronic fear of the wind. "Anemos" is a Greek word for wind. Windy days can certainly be difficult to cope with. The National Weather Service issues wind advisories when winds are expected to reach 30 mph.

Outlook:

Warming up over the weekend with a chance for showers and thunderstorms by Sunday and Monday. Cooler weather again for Tuesday and Wednesday of next week, then warming significantly as we approach next weekend with highs returning to the 80s and 90s F.

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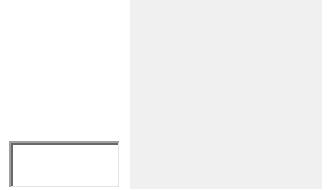
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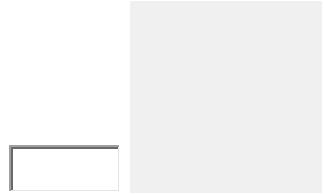
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Minnesota WeatherTalk Newsletter for Friday, July 8, 2011

To: MPR Morning Edition Crew
From: Mark Seeley, University of Minnesota Extension
Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, July 8, 2011

Headlines:

- Rough start to July
- New climate normals at Duluth
- Weekly Weather Potpourri
- MPR listener question
- Almanac for July 8th
- O3sonde
- Outlook

Topic: Rough start to July in some parts of Minnesota

Friday, July 1st brought dewpoints in the 70s F, Heat Index values well over 100 F (107 F in the Twin Cities), as well as hail, severe thunderstorms, and even tornadoes. Late afternoon temperatures ranged from 90 to 99 degrees F, with Heat Index Values from 100 to 113 degrees F. Then starting about 4:30 pm strong storms started to develop. At least a dozen Minnesota counties reported hail and very strong, damaging winds. There were reports of tornadoes in Redwood, Renville, and Stearns Counties. Crop damage was in evidence in many corn and soybean fields, and a number of grain storage facilities were damaged or destroyed by the strong winds.

Following a relatively quiet weekend, more severe thunderstorms developed late on July 4th and made their way across northwestern Minnesota counties. Large hail was reported in Kittson, Roseau, Polk, Marshall, and Norman Counties. A brief tornado was reported near Shelly (Norman County). Strong thunderstorm winds were also reported in Wilkin, Itasca, Big Stone, and Clay Counties, with many gusts over 60 mph. Many farmers reported both hail and wind damage to crops as well. You can read more about these storms at National Weather Service web sites.....

<http://www.crh.noaa.gov/fgf/>
<http://www.crh.noaa.gov/mpx/>

On the brighter side of things temperatures are running from 3 to 7 degrees F warmer than normal so far in July, helping crops to catch up on their development after a late planting season.

Topic: Further talk about new climate normals

John Myers of the Duluth News Tribune has written a good article about how the climate normals for Duluth have changed, including an upward trend in temperatures for nearly all months. It appears that January has warmed the most. You can read it online at...

<http://www.duluthnewstribune.com/event/article/id/203741/>

Weekly Weather Potpourri:

A massive dust storm swept through the Phoenix, AZ area late in the day on Tuesday (July 5th), leaving a thick coating of dust on cars, knocking out power, and reducing visibility. The airport had to be closed for a time as well. Nearly a mile high wall of dust was visible as the storm approached the city. You can find more at...

http://www.usatoday.com/weather/storms/2011-07-07-phoenix-dust-storm_n.htm

The July 4th holiday was an unusual one for ski resorts in California, Utah, and Colorado. Late season storms left an especially large snow base that provided adequate skiing and snow boarding at many high altitude resorts. A relatively warm high pressure system brought nice weather to these resorts with temperatures in the 50s and 60s. So guests dressed in shorts, bikinis and Hawaiian style shirts made their way to the slopes and enjoyed a rare form of recreation for July 4th. More at....

http://www.usatoday.com/news/nation/2011-07-02-ski-resorts-fourth-of-july_n.htm

The 3rd Tropical Storm of the 2011 season formed in the Eastern North Pacific Ocean this week off the coast of Mexico. Tropical Storm Calvin was packing winds of 50 mph as it moved N-NW away from the Mexican and Baja California coast lines. It was expected to weaken over the weekend.

The BBC Weather Centre reported a very unusual heavy snowfall in the Atacama Desert of South America. From 20 to 30 inches of snowfall was reported from this part of Chile. This amount of snowfall has not occurred in this landscape for over 20 years and it impeded traffic in many areas as they are not equipped to provide snow plowing. See more at...

<http://www.bbc.co.uk/news/science-environment-14067245>

MPR listener question: Tom Crann, host of All Things Considered (M-F on MPR) passed along a question related to the value of reporting Relative Humidity or Dewpoint during the summer months. Which of these conveys the most useful information?

Answer: In terms of human comfort, the single value of dewpoint, especially in the summer months, provides a good indicator that you should pay attention to. Dewpoints above 60 degrees F make most of us feel uncomfortable, and certainly above 70 degrees F makes our air conditioning systems work hard to keep indoor environments at a comfortable level. Dewpoints above 70 degrees F, and certainly above 80 degrees F, invariably lead to a heat advisory as they tend to raise the Heat Index value to near 100 degrees F or higher (as happened last Friday, July 1st for example). Such levels can bring stress, especially to those who must work outdoors, or the elderly.

On the other hand, for certain summer activities I like to hear the relative humidity reported. For example if you are going to the beach or swimming pool on a summer afternoon and the relative humidity is expected to be less than 30 percent, you can count on feeling cold when you step out of the water, because your body will be exposed to amplified rapid drying by the surrounding air. Conversely, if you are planning an evening or early morning activity and the relative humidity is already in the 90 percent range or higher, you can almost count on encountering fog, especially in low lying areas or around lakes and river valleys. This may be important in planning your travel.

In the end there are valid reasons for reporting both dewpoint and relative humidity.

Almanac for July 8th:

The average MSP high temperature for this date is 83 degrees F (plus or minus 7 degrees standard deviation), while the average low is 63 degrees F (plus or minus 6 degrees standard deviation).

MSP Local Records for July 8th:

MSP weather records for this date include: highest daily maximum temperature of 101 degrees F in 1936 and 1974; lowest daily maximum temperature of 65 degrees F in 1895 and 1997; lowest daily minimum temperature of 51 degrees F in 1958; highest daily minimum temperature of 82 degrees F in 1936; record precipitation of 3.07 inches in 1925; no measurable snowfall has been recorded on this date.

Average dew point for July 8th is 59 degrees F, with a maximum of 74 degrees F in 1983 and a minimum of 42 degrees F in 1953.

All-time state records for July 8th:

Scanning the state climatic data base: the all-time high for this date is 110 degrees F at Fosston (Polk County) in 1936; the all-time low is 25 degrees F at Kelliher (Beltrami County) in 2003. The all-time record precipitation amount for this date is 6.03 inches at White Rock Dam (Traverse County) in 1950. No measurable snowfall on this date in Minnesota.

Past Weather Features:

July 8, 1936 was the middle of a terrible heat wave in Minnesota, lasting from July 5th to the 18th. Virtually every climate station in Minnesota reported daytime temperatures of 100 degrees F or greater, with the exception of Two Harbors (98 F) and Grand Marais (89 F) along the Lake Superior shoreline. Moorhead reported 9 days over 100 degrees F, including 114 degrees F on the 6th. The July heat wave was blamed for over 800 deaths in Minnesota.

About 7:20 pm on July 8, 1999 an F-2 (winds 113-157 mph) tornado touched down near Lewiston, MN (Winona County) and carved a path 3.5 miles long and about 100 yards wide. Four homes were destroyed and 26 others damaged. There was also serious damage to some farms outside of town.

July 8, 2002 brought heavy rains and flash flooding to some parts of central Minnesota, where roads were closed due to flooding. Gull Lake reported 5.16 inches of rain, while Brainerd had 4.76 inches, Aitkin 4.59 inches, and Wadena 4.35 inches.

Word of the Week: O3sonde

This is a term used to refer to an ozonesonde, a balloon carried instrument package that rises through the atmosphere and measures the vertical distribution of ozone. This instrument package is mostly used in research to assess seasonal patterns in ozone distribution by latitude. It has been more commonly used in research since the 1990s.

Outlook:

Warm and humid over the weekend with a chance for scattered showers and thunderstorms, especially on Saturday. Drier on Monday and Tuesday with a chance for showers again by late Wednesday and Thursday next week.

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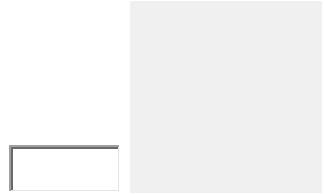
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Minnesota WeatherTalk Newsletter for Friday, July 15, 2011

To: MPR Morning Edition Crew
From: Mark Seeley, University of Minnesota Extension
Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, July 15, 2011

Headlines:

- More severe weather
- Comment on new climate normals
- Weekly Weather Potpourri
- MPR listener question
- Almanac for July 15th
- Past weather
- Manhattanhenge
- Outlook

Topic: More July severe weather

July 10-11 (Sunday-Monday) brought more severe weather to parts of Minnesota. A tornado was reported in Meeker and Kandiyohi Counties and large hail was reported in Pipestone County. But the more widespread reports of severe weather included strong winds (50-90 mph) and some heavy rainfall, especially in west-central Minnesota's Pope, Douglas, and Stearns Counties where hundreds of trees were blown

down. A more complete report of the wind damage can be found on the NOAA-National Weather Service web site....

<http://www.crh.noaa.gov/mpx/>

Through the first 15 days of the month some areas of the state have already reported above normal July rainfall amounts. Some of these include:

6.37 inches at Melrose
6.06 inches at Lakefield
5.68 inches at Kimball
5.57 inches at Madison
7.77 inches at Worthington
4.64 inches at Sherburn
4.27 inches at Browns Valley
4.05 inches at Watson

These amounts will undoubtedly be added to over the remainder of the month. Temperatures are already averaging several degrees F warmer than normal for the month and it is expected to get hotter yet.

July 15th (Friday) brought more heavy rains to many parts of the state including west-central Minnesota. Near Lake Carlos and Osakis from 4 to 6 inches of new rainfall occurred. Some farmers reported hail up to 1.75 inches in diameter as well.

Topic: A comment on the new climate normals

The World Meteorological Organization (WMO) recommends that the weather services of member nations re-compute climate normals (averages) every decade. In the USA the National Oceanic and Atmospheric Administration-National Climatic Data Center (NOAA-NCDC) complies with this recommendation and will provide new climate normals for the most recent three decades, 1981-2010. These new normals will be released in two phases, the first coming July 1, 2011, followed by a second more comprehensive data set to be released toward the end of the year. The new data will replace the older normals which were derived for the 1971-2000 period. These new normals will include calculations of monthly average precipitation, temperature, and Heating and Cooling Degree Days. In addition NOAA-NCDC will calculate and publish daily normals of maximum, minimum, and mean temperatures, as well as precipitation (including rainfall and snowfall). Other detailed climate attributes and statistics will be available as well, including standard deviations of mean values.

As these new normals of climate attributes become commonly available and used throughout Minnesota it is important to remember that our frame of reference for climate averages will change in some meaningful ways. For example, most locations in Minnesota will become “wetter.” That is the new normals for monthly and annual precipitation will be larger values than those used from the 1971-2000 period. For example at the University of Minnesota Southern Research and Outreach Center in Waseca, the normal annual precipitation will change from 34.72 inches to 35.72 inches, a rise of about 3 percent. Similar changes in annual precipitation, some to lesser values, but most to greater values (by 1 to 5 percent) will be depicted in the normals for all other Minnesota climate stations. In addition, many temperature normals (both daily and monthly) will rise as well, at least by a few tenths of a degree F. For example at Crookston, MN the average annual temperature for 1981-2000 is 40.1 degrees F, 0.3 degrees F higher than the previous normal. But for the month of January, the mean temperature value rose from 3.8 degrees F (1971-2000) to 6.1 degrees F (1981-2010) at Crookston. This pattern showing a larger increase in mean monthly temperatures for the winter season as compared to the other seasons is typical for most climate stations in the state.

These changes in climate normals remind us that our climate is not static in its behavior. Changes in our climate’s attributes have been measurable over time and therefore our frame of reference in thinking about what is average or normal requires periodic adjustment as well. These gradual climate changes depicted in the calculations of “normals” can be linked to consequences in our use of energy, adjustments in agriculture, management of water resources, and maintenance and modification in our transportation infrastructure. Science has taught all of us that it is important to be aware of these changes in climate and how they affect our world.

Weekly Weather Potpourri:

State climatologists report quite a contrast in temperature patterns across the USA over the past three months. In Oregon and Washington states April through June was one of the coldest such periods in history, while New Mexico, Oklahoma, Texas, and Louisiana have recorded one of the warmest April through June periods in history. Earlier this week every weather observer in Oklahoma was reporting a daytime temperature above 100 degrees F, including 114 degrees F at Freedom, OK.

Typhoon Ma-on was churning in the Western North Pacific Ocean this week between Saipan and Japan. It packed sustained winds of 125 mph with gusts over 155 mph, generating high seas and heavy rain bands. It is expected to impact Kyoto, Japan by the middle of next week still packing strong winds and heavy rains.

A recent paper by University of Buffalo scientists documents that Greenland's glaciers advanced at roughly the same pace and magnitude during global cooling times (Little Ice Age) as they are retreating in modern times. For example Glacial Lake Morten formed in only five years, from 1795 to 1800. You can read more about this study at...

<http://www.sciencedaily.com/releases/2011/07/110714141333.htm>

The British Met Office reports that strong winds and rains will make the weekend rounds of the British Open Golf Tournament in Sandwich, England much more challenging than the opening rounds. Those players who can cope with foul weather may fare better in such conditions, though scores may soar.

MPR listener question: From my perspective Tuesday and Wednesday of this week brought perfect July weather with dewpoints in the 40s and 50s F and comfortable afternoon temperature readings. But when the dewpoints get low in July it often gets quite cold up north. Was that the case again this week? How cold did it get at Tower and Embarrass for example?

Answer: On Wednesday overnight temperatures fell to 39 degrees F at Tower and 37 degrees F at Embarrass. Other lows up north included 39 degrees F at Crane Lake, Cook, and Bigfork, 38 degrees F at Orr, and 35 degrees F at Brimson. Great sleeping bag weather for campers. Those may end up being the coldest temperatures for the month.

Almanac for July 15th:

The average MSP high temperature for this date is 83 degrees F (plus or minus 7 degrees standard deviation), while the average low is 62 degrees F (plus or minus 6 degrees standard deviation).

MSP Local Records for July 15th:

MSP weather records for this date include: highest daily maximum temperature of 102 degrees F in 1988; lowest daily maximum temperature of 63 degrees F in 1962; lowest daily minimum temperature of 49 degrees F in 1912; highest daily minimum temperature of 79 degrees F in 1988; record precipitation of 1.87 inches in 1907; no measurable snowfall has been recorded on this date.

Average dew point for July 15th is 59 degrees F, with a maximum of 77 degrees F in 1968 and a minimum of 43 degrees F in 1912.

All-time state records for July 15th:

Scanning the state climatic data base: the all-time high for this date is 112 degrees F at Beardsley (Big Stone County) in 1931; the all-time low is 30 degrees F at Sawbill Camp (Cook County) in 1939. The all-time record precipitation amount for this date is 7.37 inches at New Ulm (Brown County) in 1916. No measurable snowfall on this date in Minnesota.

Past Weather Features:

On July 15, 1916 flash flooding occurred in portions of Nicollet, Watonwan, and Blue Earth Counties. At New Ulm, over 7 inches of rain fell between 5:00 and 11:00 pm, washing out bridges, roads, and crop fields. Destructive hail storms also occurred across southern Minnesota.

A heat wave gripped the state over July 14-18, 1931. On the 15th over 20 Minnesota communities reported daytime temperatures of 100 degrees F or higher. Beardsley reported 9 days during the month with temperatures of 100 degrees F or higher. Crops suffered mightily from both heat and moisture stress.

July 15, 1993 brought flash flooding to parts of Clay, Becker, and Mahnomen Counties in northwestern Minnesota. Slow moving thunderstorms brought 3 to 7 inches of rainfall. Many basements were flooded, roads were washed out, and a number of crop fields were underwater. Moorhead and Mahnomen observers ended up reporting about 10 inches of rainfall for the month, one of the wettest Julys ever for those locations.

Word of the Week: Manhattanhenge

Similar to Stonehenge in England, this is the name given to the remarkable effect of the Manhattan skyline in New York City this time of year. During mid July many of the avenues in Manhattan that are lined with skyscrapers frame the setting sun in a manner that is similar to Stonehenge. The longer wave lengths cast a red hue on the walls of the buildings making for an unusual visual effect and many people turnout to photograph it. You can read more about it at the BBC web site and see pictures....

<http://www.bbc.co.uk/news/magazine-14150550>

Outlook:

Warm and humid with a chance for showers and thunderstorms in eastern sections early in the weekend (Sat), then continuing warm for several days with many temperatures in the 90s F and Heat Index Values well over 100 degrees F during the Sunday through Wednesday period. Some relief from the heat may be possible in far

northern counties where daytime highs may stay in the 80s F. Chance of showers returns by late Wednesday and Thursday next week.

Further Information:

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<http://www.climate.umn.edu/weathertalk/>

For access to other information resources go to

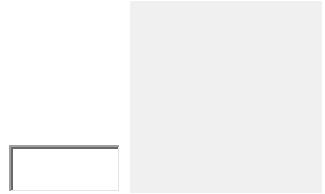
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Minnesota WeatherTalk Newsletter for Friday, July 22, 2011

To: MPR Morning Edition Crew
From: Mark Seeley, University of Minnesota Extension
Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, July 22, 2011

Headlines:

- State Climate Office Opens Again
- New Seasonal Climate Outlook
- Many weather records broken this week
- Weekly Weather Potpourri
- MPR listener question
- Almanac for July 22nd
- Past weather
- Humidex
- Outlook

Topic: State Climate Office Open Again

With state employees back to work this week, it was a great relief to have the State Climatology Office back in operation. Welcome back to Jim Zandlo, Greg Spoden, and Pete Boulay, our outstanding DNR climatologists. The Climatology Working Group web site (www.climate.umn.edu) is now back in operation too, with access to the state database, current weather, publications, and various web tools.

Topic: New Climate Outlook

The NOAA-Climate Prediction Center released a new seasonal climate outlook on Thursday this week. The outlook for Minnesota calls for a weather pattern that favors above normal temperatures in the eastern and southern portions of the state during the August through October period. So perhaps Minnesota crops will be spared from early frost. The precipitation outlook favors wetter than normal conditions in the western regions of the state during this same period. In this context crops should not be lacking for water as they go through their reproductive growth period, and further flows on many western Minnesota watersheds are likely to remain higher than normal for much of the summer.

Topic: New climate normals (1981-2010) available easily online

Jan Null, climatologist with Golden Gate Weather Services in California has placed the nation's new climate normals on their web site in a user friendly manner. You can click on any state and retrieve a tabular listing of monthly and annual normals for temperature, precipitation, and snowfall. Some noteworthy examples show the Twin Cities annual precipitation normal increased to 31.16 inches, while the seasonal snowfall normal decreased slightly to 53.9 inches. At Duluth the seasonal snowfall normal increased from 84.3 inches to 86.1 inches. Caledonia in Houston County remains the wettest spot in the state with an annual precipitation normal of just under 37 inches, while Wolf Ridge Environmental Learning Center near Finland (Lake County) is the snowiest spot with a seasonal normal of 89.6 inches. You can view the new normals at...

<http://ggweather.com/normals/>

Topic: Many weather records were broken this week

Despite the near absence of 100 degrees F temperature readings, the period from July 16 to July 20 was one of the hottest five day periods in Minnesota history in terms of human comfort. The only weather observer to report a three-digit air temperature was Blue Earth with 102 degrees on the 20th. But some observers reported Heat Index Values of 100 degrees F or higher on five consecutive days. At Moorhead, dewpoints hit 80 degrees F or higher everyday from the 16th to the 20th, topping out at 88 degrees F on July 19th with a Heat Index of 134 degrees F, both tentatively new statewide records.

The Twin Cities endured for the first time a period of three consecutive days with dewpoints hitting 80 degrees F or higher. On July 19th a new all-time dewpoint level was achieved with a reading of 82 degrees F, topped by a sub-hourly reading of 84

degrees F. These new records will have to be certified by the State Climate Office. Preliminary data also indicate a new Heat Index record of 124 degrees F was reached in the Twin Cities on the 19th.

Even far northern areas reached uncharted dewpoint and Heat Index values during this period. Hallock hit a dewpoint of 84 degrees F with a Heat Index of 111 degrees F on the 19th, while Winnipeg, Manitoba (Canada) reported a dewpoint of 77 degrees F and a Heat Index of 109 degrees F, both new records.

Those without air conditioning suffered as overnight low temperatures set records for warmth as well, with many observers reporting minimum temperatures that ranged from 77 degrees F to 82 degrees F. The Heat Index at midnight on July 20th in the Twin Cities was still 100 degrees F, perhaps the only time it has been so high that late at night.

The heat and humidity dominated the weather in many other states this week causing some cattle and poultry mortality in the Dakotas, and some human mortality in other states. For the most part Minnesota citizens took precautions and looked after each other, as well as looking after farm animals and pets.

In summary the heat wave this week will be noted for its amplitude (many places reporting Heat Index values from 110 to 120 F), it's longevity (5-days in many places), and it's widespread distribution (nearly the whole state was under the heat dome). The harbor at Grand Marais was one of the few spots to escape, as they saw mostly temperatures in the 80s F during the day and 50s and 60s F at night.

Weekly Weather Potpourri:

In tropical weather news this week, Typhoon Ma-on brought heavy rains to parts of Japan, while Hurricane Dora spun off the coast of Mexico, and moved off the southern coast of Baja California as it weakened. Tropical Storms Bret and Cindy remained at sea over the North Atlantic and continued to move east away from the USA.

On Tuesday of this week a second dust storm (another one struck on July 5th) struck the Phoenix, AZ area bringing a massive cloud of dust up to 3000 feet high across the city. The airport was closed for a time and people had to stay indoors.

The United Kingdom Meteorological Office announced a new subscription service which provides users with tropical weather forecast out to 15 days, including strike probabilities for tropical storms and hurricanes. The service is designed for those who

need to assess risk to transportation and operations that are conducted in the tropical latitudes. You can read more about this new service at...

<http://www.metoffice.gov.uk/news/releases/archive/2011/storm-tracker>

Researchers at MIT have developed a model to estimate maximum tree height for different environmental conditions. They claim the model works accurately if local meteorological data on temperature, precipitation, solar radiation, and humidity are available. You can read about this model and its application at....

<http://www.sciencedaily.com/releases/2011/07/110718121724.htm>

MPR listener question: I have heard that during Heat Waves there are few tornadoes reported. Is this generally true?

Answer: Yes, most of the time Heat Waves are produced by static high pressure systems which tend to bring atmospheric stability. There are exceptions. For example this week the high water vapor content of the air combined with surface heating by the strong sun produced some convective thunderstorms which delivered intense rainfalls (3-5 inches in some parts), and even a tornado near Karlstad (Kittson County) on July 20th. Still, on a national scale there has been a relative absence of tornadoes (about a dozen reports in the past week) during the massive Heat Wave which has encompassed so many states.

Almanac for July 22nd:

The average MSP high temperature for this date is 84 degrees F (plus or minus 8 degrees standard deviation), while the average low is 64 degrees F (plus or minus 6 degrees standard deviation).

MSP Local Records for July 22nd:

MSP weather records for this date include: highest daily maximum temperature of 105 degrees F in 1934; lowest daily maximum temperature of 64 degrees F in 1992; lowest daily minimum temperature of 49 degrees F in 1947; highest daily minimum temperature of 77 degrees F in 1984; record precipitation of 2.69 inches in 1997; no measurable snowfall has been recorded on this date.

Average dew point for July 22nd is 60 degrees F, with a maximum of 76 degrees F in 1952 and a minimum of 40 degrees F in 1925.

All-time state records for July 22nd:

Scanning the state climatic data base: the all-time high for this date is 111 degrees F at Beardsley (Big Stone County) in 1934; the all-time low is 31 degrees F at Meadowland (St Louis County) in 1985. The all-time record precipitation amount for this date is 10.84 inches at Fort Ripley (Crow Wing County) in 1972. No measurable snowfall on this date in Minnesota.

Past Weather Features:

July 21, 1884 about 2:00 pm an F-4 tornado (winds 206 mph or greater) traveled 30 miles across portions of Rock and Nobles Counties in southwestern Minnesota. Many farms around Luverne and Adrian were destroyed and two people were killed.

July 22, 1934 marked the middle of a six-day heat wave in Minnesota. Over two dozen cities reported daytime highs of 100 degrees F or greater. New Ulm reported six consecutive days of 100 F readings. The heat was quite damaging to the corn crop.

July 21-22, 1972 brought one of the largest flash floods in state history to central Minnesota. Portions of Crow Wing, Morrison, Aitkin, and Mille Lacs Counties saw over 10 inches of rain, with individual observers reporting over a foot. The flash flooding covered over 1500 square miles and closed dozens of state and county roads and highways.

Word of the Week: Humidex

This term refers to the Canadian analogy to our National Weather Service Heat Index. It describes the combined effects of temperature and humidity (dewpoint) on the human body, and is scaled similarly to what our National Weather Service uses. Environment Canada reported many cities in Manitoba and Ontario saw record high Humidex readings this week ranging from 101 to 109 degrees F, as they too suffered from unusual dewpoints near 80 degrees F, and air temperatures in the low 90s F.

Outlook:

Near normal temperatures over the weekend and into next week, with a chance for showers and thunderstorms on Saturday (some perhaps may reach severe levels). It will be windy late Saturday and early Sunday, then generally nice through Tuesday. Chance for showers and thunderstorms again by late Tuesday and Wednesday next week.

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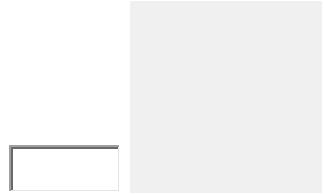
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Minnesota WeatherTalk Newsletter for Friday, August 5, 2011

To: MPR Morning Edition Crew
From: Mark Seeley, University of Minnesota Extension
Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, August 5, 2011

Headlines:

- Records rains to start August
- New weather records certified
- Hit by lightning
- Weekly Weather Potpourri
- MPR listener question
- Almanac for August 5th
- Past weather
- IC and CG flashes
- Outlook

Topic: Record rains to start August

For some parts of Minnesota August began with the same hot, humid conditions which had prevailed in July. In many areas dewpoints climbed into the upper 70s F on August 1st and severe thunderstorms developed, with heavy rain and strong wind. Some of the strongest storms produced record or near-record rainfalls in portions of northern and central Minnesota over August 1-2. Some of these amounts included:

4.39 inches at Floodwood, 3.95 inches at Litchfield, 3.62 inches at Glenwood, 3.17 inches at Bruno, 2.48 inches at Alexandria, 2.25 inches at Moose Lake, and 2.15 inches at Duluth. The dewpoint at Litchfield hit 79 degrees F, most likely a record high value for August as well.

Topic: New weather records certified

Many new record dewpoints, warm minimum temperatures, and Heat Index Values were reached during the month of July around Minnesota. The NOAA National Weather Service in partnership with the DNR-State Climatology Office has been busy trying to certify these records by checking instrument calibration and performance, along with measurements from surrounding stations. The highest dewpoint ever measured at the Twin Cities station (MSP) is now 82 degrees F (mid-afternoon July 19th), while the highest dewpoint ever measured in the state is now 88 degrees F at Moorhead, measured between 7:00 and 9:00 pm also on July 19th (see http://www.climate.umn.edu/doc/journal/dew_point110719.htm). In fact it appears that Moorhead also hit a new state record Heat Index Value that day with 134 degrees F.

The high dewpoints were associated with many July temperature records for the warmest overnight minimum temperatures as many observers reported nights when the overnight low never dipped below 80 degrees F. Because of the many warm nights, as well as warm days, July 2011 ranks as the 8th warmest in state history, and 5th warmest in the Twin Cities area

(see http://www.crh.noaa.gov/news/display_cmsstory.php?wfo=mpx&storyid=56115&source=0)

From the standpoint of tropical-like dewpoints, summer of 2011 has brought more hours with a dewpoint of 75 F or higher than any other summer in history for the Twin Cities.....

(http://www.climate.umn.edu/doc/journal/muggy_2011.htm)

with 101 hours, beating the old record of 78 hours in the summer of 2001 (the historical average is only 18 hours).

Topic: Hit by lightning

Among the traumatic weather events this week the Seeley household was struck by lightning on Monday afternoon (August 1st). My wife and daughter were at home, and thankfully not seriously injured. No fire resulted, but many items were damaged by the strike including the central AC, garbage disposal, garage door opener, TV, DVD player, some smoke alarms, the cable TV and phone systems, and other things.

One of the most peculiar features was that the lightning strike knocked some pictures off the wall and left a few quarter size holes in the drywall. Very strange what lightning can do. Thank goodness for Ground Fault Interrupters that are installed on most circuits. Those systems saved the computer, and many large appliances in the house.

Weekly Weather Potpourri:

The remnants of Tropical Storm Emily brought heavy rains (6-12 inches) to parts of the Dominican Republic and Haiti on Thursday and Friday of this week. Meanwhile Hurricane Eugene was spinning off the SW coastal area of Baja California and not presenting a threat to land. In the Western North Pacific Ocean Typhoon Muifa was churning over open water south of Japan generating winds over 115 mph and sea waves of 35 feet. This typhoon is expected to bring heavy rains and strong winds to the coast of China over the weekend. Tropical Storm Merbok was NW of Wake Island and no threat to land but producing seas of 21 feet and it was expected to strengthen into a typhoon.

On Monday of this week (Aug 1) a tornado caused a good deal of damage in the eastern Russian city of Blagoveshensk. Amateur video of the tornado going through the city can be found at...

<http://www.bbc.co.uk/news/world-europe-14364506>

One hundred-fifty years ago this week the London Times published the first weather forecast in printed form. It was issued by Admiral Robert FitzRoy for regions within the United Kingdom. Interestingly enough the forecast proved to be correct.

This week in Science a team of Danish scientists have published an account of Arctic Sea Ice over the past 10,000 years which shows dramatic seasonal and annual variations that are larger than those of the modern era. Their data show dramatic shifts and declines in summer sea ice that even exceed those measured in the summer of 2007. You can read more at....

<http://www.sciencedaily.com/releases/2011/08/110804141706.htm>

MPR listener question: My husband and I live in an old farmhouse. When the humidity is high the basement smell is strong. In addition any pet-accident spots on the carpet seem to be more pungent. Do odors travel faster/easier through humid air?

Answer: Great question. Indeed odors do travel faster, easier, and maintain their concentration through humid air because it is less dense than dry air. I know for many

people this seems counter-intuitive, but it is true. Humid air feels close because it affects our thermoregulation (keeping our body temperature stable)....we have to start sweating or panting sometimes to dissipate our body heat in humid air, and we say how the air feels close, but it is actually less dense. The molecules which produce odors (be it flower fragrances or offensive smells) can travel easier through the less humid air. This is partly why walking through a garden in the early morning hours when the humidity is high provides a pleasurable and fragrant experience.

Almanac for August 5th:

The average MSP high temperature for this date is 83 degrees F (plus or minus 6 degrees standard deviation), while the average low is 63 degrees F (plus or minus 6 degrees standard deviation).

MSP Local Records for August 5th:

MSP weather records for this date include: highest daily maximum temperature of 100 degrees F in 1947; lowest daily maximum temperature of 67 degrees F in 1912; lowest daily minimum temperature of 48 degrees F in 1994; highest daily minimum temperature of 78 degrees F in 1947; record precipitation of 1.88 inches in 1898; no measurable snowfall has been recorded on this date.

Average dew point for August 5th is 60 degrees F, with a maximum of 75 degrees F in 1959 and a minimum of 33 degrees F in 1910.

All-time state records for August 5th:

Scanning the state climatic data base: the all-time high for this date is 104 degrees F at Moorhead (Clay County) in 1947; the all-time low is 31 degrees F at Brimson (St Louis County) in 1994. The all-time record precipitation amount for this date is 4.75 inches at Albert Lea (Freeborn County) in 1945. No measurable snowfall on this date in Minnesota.

Past Weather Features:

In the early morning between 4:00 and 5:00 am on August 5, 1892, an F-2 tornado (winds 113-157 mph) passed through Marshall, MN (Lyon County) unroofing the courthouse and destroying one home. The funnel was only on the ground for 1 mile, but certainly woke up the entire town.

Over August 4-5, 1898 severe thunderstorms visited southwestern Minnesota. Hail and heavy rainfall caused serious crop damage and flooding. Lightning killed eight

people as well as some livestock. Total rainfall was record-setting for some, including Bingham Lake with 3.70 inches, New Ulm with 5.17 inches, St Peter with 3.11 inches, and Bird Island with 2.93 inches.

August 4-5, 1947 brought a two-day heat wave to Minnesota. Over two dozen communities reported 100 degrees F or higher. The heat returned later in the month, pushing temperatures passed the 100 F mark as well. August of 1947 went into the record books as the 3rd warmest in state history.

Word of the Week: IC and CG flashes

These terms are used in the business of lightning detection devices. An IC device can be used to detect intra-cloud flashes of lightning, while a CG device can be used to detect cloud to ground flashes. Many networks use both types of sensors. Both the radio frequency and the electromagnetic signal emitted by lightning are used by detection devices. In addition optical sensing is used as well. More information on the National Lightning Detection Network System can be found at...

http://gcmd.nasa.gov/records/GCMD_NLDN.html

Outlook:

Near seasonal temperatures with a chance for showers and thunderstorms on Saturday, especially in the northern sections of the state. Another chance for showers and thunderstorms by Monday and Tuesday next week. Drier and cooler by midweek.

Further Information:

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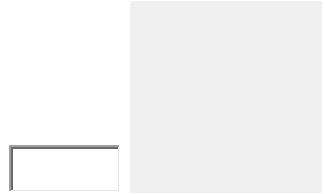
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Minnesota WeatherTalk Newsletter for Friday, August 12, 2011

To: MPR Morning Edition Crew

From: Mark Seeley, University of Minnesota Extension

Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, August 12, 2011

Headlines:

- Some cold temperatures this week
- Heavy rains on August 6th
- Follow up to dewpoint records
- Book appearance for Voyageur Skies
- Weekly Weather Potpourri
- MPR listener question
- Almanac for August 12th
- Outlook

Topic: Record cold this week up north

Following such a hot July and warm start to August who would have guessed we would see some record low temperatures materialize on August 10th (Wed). Northern Minnesota observers reported morning lows in the 30s F on Wednesday this week. Embarrass reported just 36 degrees F on August 10th (but it was not a record for them), while Orr, Bigfork, and Tower reported 39 degrees F. The record-setters occurred at International Falls with 39 degrees F (tied record from 1982), 37 degrees

F at Crane Lake (tied record from 1967), and 38 degrees F at Hibbing (new record low).

Elsewhere overnight temperatures dipped into the 50s and 60s F making for comfortable sleeping. Many homeowners took the opportunity to open windows and air-out houses which had been primarily closed up during the hot July period. In addition the cool nights brought some relief from mosquitoes and helped green tomatoes ripen (ideal ripening temperatures are 65-75 degrees F for the carotene and lycopene pigments). So in general the cool August spell of weather this week was most welcome by vegetable gardeners. You can read more from Extension about vegetable gardening at...

<http://www.extension.umn.edu/distribution/horticulture/m1246.html>

Topic: More heavy rains for central Minnesota

Very strong thunderstorms moved across central Minnesota counties last Saturday (Aug 6) bringing heavy rainfall amounts to many places. Mora received 2.20 inches of rainfall in a little over 1 hour. Others reporting large amounts of rainfall included Little Falls with 1.95 inches, Rush City with 2.23 inches, Garrison with 2.35 inches, Brainerd with 2.15 inches, and Isle with 2.43 inches. For Brainerd, Isle, and Mora those were new record amounts of rainfall for August 6th. Further, on Friday, August 12th Halstad (Norman County) in the Red River Valley received a record amount of rainfall from an overnight thunderstorm which delivered 2.09 inches.

Topic: Follow up on last month's (July) record dewpoints in Minnesota

After July brought so many record setting dewpoints to Minnesota (new state record of 88 F at Moorhead) I have had a number of MPR listeners ask about record dewpoints elsewhere. Chris Burt with the Weather Underground has provided a synopsis of all-time high dewpoint measurements in the USA and the world. You can read is article at...

<http://www.wunderground.com/blog/weatherhistorian/article.html?entrynum=36>

Topic: Book appearance for Voyageur Skies

Co-author Don Breneman and I will be at Park-Midway Bank in St Anthony Park (2300 Como Ave, Saint Paul, MN 55108) from 5:00 to 7:00 pm on Thursday, August 18th to talk about our new book Voyageur Skies: Weather and the Wilderness in Minnesota's National Park. Macawber's Bookstore will be selling the book at the

event and Don and I will be signing books as well. Please drop by if you are interested. Snack food and beverages will be served.

Weekly Weather Potpourri:

NOAA's Education Office has just released an important publication for all those who love to garden. It is called "Climate Resources for Master Gardeners" and it is available online as a .pdf file. I would encourage Minnesota gardeners to give it a try. It is a great resource. Go to...

<http://www.cocorahs.org/Content.aspx?page=MasterGardener>

Thanks to Ed Hessler of Hamline University for reference to a recent article by author Chris Mooney on the teaching of science, particularly climate science. It is very insightful with respect to both science and the teaching profession. I would encourage you to read it.....

<http://www.desmogblog.com/attacks-climate-science-education-are-picking-steam>

Very heavy rains brought flooding to parts of Scotland on Wednesday this week. Rail service between Glasgow and Edinburgh was disrupted and many basements were said to be flooded. Rainfall around Glasgow was said to be the heaviest in some years.

NOAA scientists have released a preliminary assessment of the record heat of July across the USA in mapped form. The map depicts where 2,755 daily maximum temperature records were set, and another map depicts where 6,171 highest minimum temperatures were set. You can view these maps at...

<http://www.nnvl.noaa.gov/MediaDetail.php?MediaID=795&MediaTypeID=1>

The NOAA Storm Prediction Center reports a very quiet month of August so far in terms of tornadoes. Only 11 tornado reports have been filed so far this month and the historical average for the month across the nation is about 115.

MPR listener question: With all the heavy rain storms this season have any observers already reported 30 inches of precipitation for the year?

Answer: Indeed, both Andover (Anoka County) and Milaca (Mille Lacs County) observers have reported over 30 inches so far this year. Somewhat unusual for observers in the central part of the state to report the most precipitation, but that is the way it is. The driest areas in the state are in the far north and northeast.

Almanac for August 12th:

The average MSP high temperature for this date is 80 degrees F (plus or minus 7 degrees standard deviation), while the average low is 61 degrees F (plus or minus 6 degrees standard deviation).

MSP Local Records for August 12th:

MSP weather records for this date include: highest daily maximum temperature of 94 degrees F in 1886 and 1965; lowest daily maximum temperature of 61 degrees F in 1916 and 1964; lowest daily minimum temperature of 45 degrees F in 1961; highest daily minimum temperature of 74 degrees F in 1936; record precipitation of 2.42 inches in 1985; no measurable snowfall has been recorded on this date.

Average dew point for August 12th 8th is 59 degrees F, with a maximum of 79 degrees F in 1995 and a minimum of 39 degrees F in 1982.

All-time state records for August 12th:

Scanning the state climatic data base: the all-time high for this date is 101 degrees F at Redwood Falls (Redwood County) in 1965 and at Canby, Montevideo, and Madison in 1988; the all-time low is 29 degrees F at Kelliher (Beltrami County) in 2003. The all-time record precipitation amount for this date is 4.22 inches at Milaca (Mille Lacs County) in 1963. No measurable snowfall on this date in Minnesota.

Past Weather Features:

Widespread frost brought an abrupt and early ending to the growing season in northwestern Minnesota over August 11-13, 1916. Some observers reported consecutive mornings with frost.

Heavy thunderstorms visited parts of the state on August 11-12, 1963, especially across central portions of the state. Strong winds and hail up to 1 inch in diameter accompanied the storms. Wadena, Isle, and Detroit Lakes observers reported over 3 inches of rainfall, while Long Prairie, Milaca, and Ottertail observers reported over 4 inches. Many basements flooded in these communities and there was widespread crop damage reported.

During the drought year of 1988 August 10-12 brought a heat wave to many parts of western and southern Minnesota. Several observers reported triple digit temperatures as crops suffered from both drought and heat stress.

Outlook:

Somewhat cooler than normal temperatures this weekend with a chance for showers and thunderstorms early on Saturday. Generally dry and comfortable on Sunday. A warming trend will start on Monday and bring a chance for showers and thunderstorms late in the day. Chance for showers continue Tuesday and Wednesday with warmer temperatures.

Further Information:

For older versions of the "Minnesota WeatherTalk" newsletter go to

<http://www.climate.umn.edu/weathertalk/>

For access to other information resources go to

<http://www.climate.umn.edu/Seeley/>

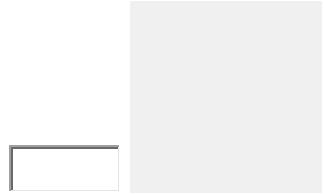
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Minnesota WeatherTalk Newsletter for Friday, August 19, 2011

To: MPR Morning Edition Crew
From: Mark Seeley, University of Minnesota Extension
Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, August 19, 2011

Headlines:

- Dose of heavy rain
- New Seasonal Climate Outlooks
- Weekly Weather Potpourri
- MPR listener question
- Almanac for August 19th
- Past Weather
- IKE
- Outlook

Topic: Two more doses of heavy rain this week

Between 5:00 pm and 8:00 pm on Tuesday, August 16th many parts of central Minnesota reported very heavy thunderstorms. Some observers recorded over two inches including: 2.09 inches in Little Canada, 2.48 inches in Stillwater, 2.30 inches at Lake Elmo, 2.67 inches at Fridley, 3.08 inches at Maple Grove, 2.33 inches in Maplewood, 3.31 inches in Vadnais Heights, 2.18 inches in Plymouth, and 2.56 inches in Pine Springs. Some intersections and basements in those communities were

flooded. The National Weather Service issued a flash flood warning for portions of Anoka, Hennepin, Chisago, Wright, , and Meeker Counties among others. The University of Minnesota St Paul Campus received 1.89 inches over that same time period. An analysis of this storm is available at the National Weather Service Chanhassen web site

http://www.crh.noaa.gov/news/display_cmsstory.php?wfo=mpx&storyid=71944&source=0

For some local observers it was their 3rd rain of 2 inches or more this season.

A second storm this week struck overnight Thursday into Friday (Aug 19) as a mesoscale convective system (MCS) developed and passed over Polk, Red Lake, Beltrami, Itasca, and St Louis Counties. It brought hail up to 1.75 inches in diameter, wind gusts up to 70 mph, and rainfall amounts ranging from 1 inch up to 2.5 inches. Street flooding was reported in Bemidji and some trees were blown down. The storm system maintained its continuity as it passed over Lake Superior into northern Wisconsin.

Topic: New Seasonal Climate Outlooks

The NOAA Climate Prediction Center released new seasonal outlooks on Thursday (Aug 18) of this week. For the Great Lakes Region, including Minnesota, the outlook favors above normal temperatures over the September through November period. There are equal chances for above or below normal precipitation during that same period, except for southwestern Minnesota which is expected to see above normal values.

Weekly Weather Potpourri:

Sunday, August 14 brought slow moving thunderstorms to the northeastern states. Record rainfalls were reported from parts of New York, New Jersey, and Connecticut. LaGuardia reported 6.60 inches (9.36 inches so far in August), JFK Airport 7.80 inches (an all-time daily record), Philadelphia 4.84 inches, and Central Park 5.81 inches (9.68 inches for August so far).

On Thursday, August 18th areas of Dorset, along the south coast of the United Kingdom suffered flooding from heavy rainfalls. Over 2 inches of rain was reported from Bournemouth and Portland. Manhole covers were lifted off on a number of streets and some business offices were closed due to high water.

NOAA announced this week a renewed effort to build a "weather-ready" nation, one that is better prepared to cope with weather disasters. So far in 2011 there have been 9 separate weather disaster which have produced at least \$1 billion or more in economic loss. This ties with 2008 for the most such disasters in one year. Tornadoes and floods have accounted for most of the damage this year so far, but much of the hurricane season remains. You can read more about this NOAA report at...

http://www.noaanews.noaa.gov/stories2011/20110817_weatherready.html

This is a good time of year to frequently check the MPCA web site for the Air Quality Index and Pollen Count. Though air quality has been primarily in the healthy range this week, the pollen counts have been quite high for ragweed and other weeds as well. The mold count has been low, but tends to go up as we get later into summer and fall. You can check regularly at

<http://aqi.pca.state.mn.us/>

MPR listener question: Will you be at the State Fair with Gary Eichten again this year? We usually try to catch your Minnesota Weather Quiz broadcast.

Answer: Yes, Gary and I will broadcast the 15th Annual Minnesota Weather Quiz from the MPR Booth (corner of Judson and Nelson) on the Fairgrounds from 11:00 am to noon on Thursday, August 25th. I hope to see you there. We'll have some prizes for participants and of course I will have to see if Gary can get a passing score on the quiz.

Almanac for August 19th:

The average MSP high temperature for this date is 81 degrees F (plus or minus 8 degrees standard deviation), while the average low is 60 degrees F (plus or minus 7 degrees standard deviation).

MSP Local Records for August 19th:

MSP weather records for this date include: highest daily maximum temperature of 97 degrees F in 1976; lowest daily maximum temperature of 61 degrees F in 1985 and 1997; lowest daily minimum temperature of 39 degrees F in 1967; highest daily minimum temperature of 75 degrees F in 1900; record precipitation of 3.19 inches in 1997; no measurable snowfall has been recorded on this date.

Average dew point for August 19th is 59 degrees F, with a maximum of 76 degrees F in 1980 and a minimum of 33 degrees F in 1950.

All-time state records for August 19th:

Scanning the state climatic data base: the all-time high for this date is 107 degrees F at Browns Valley (Traverse County) in 1976 and at Orwell Dam (Otter Tail County) in 2003; the all-time low is 23 degrees F at Beardsley (Big Stone County) in 1907. The all-time record precipitation amount for this date is 6.50 inches at Caledonia (Houston County) in 1907. No measurable snowfall on this date in Minnesota.

Past Weather Features:

August 18-19, 1907 brought severe weather to Minnesota. Between 7:00 pm and 8:00 pm on the 18th an F-2 tornado (winds 113-157 mph) moved 20 miles across Hennepin County destroying 15 cottages around Lake Independence. The tornado was obscured by an intense rain shield. It killed one person and injured 15 others. It also destroyed a barn and killed five horses. Overnight heavy thunderstorm rains inundated eastern sections of the state with Stillwater reporting 2.44 inches, Grand Meadow 3.70 inches, Red Wind 4.00 inches, and Caledonia 6.50 inches.

August 16-22, 1926 was a very wet period for parts of Minnesota. Daily thunderstorm activity brought significant amounts of rainfall and some flooding to western Minnesota communities. Hail damaged crops in some areas. Near record rainfall amounts were reported by some observers: over 5 inches at Montevideo, over 6 inches at Chatfield, nearly 7 inches at Canby, and over 8.50 inches at Willmar.

Between 4:30 pm and 5:30 pm on August 19, 1938 a rare tornado outbreak occurred in northeastern Minnesota across Aitkin, Itasca, and St Louis Counties. At least three separate tornadoes were sighted and caused damages. There were no fatalities, but six people were injured and a number of homes, cabins, and farms were damaged or destroyed. Damages were estimated at \$130,000 at the time.

Word of the Week: IKE

This is an acronym for Integrated Kinetic Energy, a new index or scale developed by NOAA scientist Mark Powell to predict the potential wind damage and storm surge from hurricanes. NOAA has used the Saffir-Simpson Scale for years, but it has been criticized for underestimating the damage caused by storm surge (intrusion of sea tide onto the land). IKE uses a continuous scale from 0 to 5.99. When and how the new IKE scale is implemented is still up to conjecture. You can read more about it at...

<http://content.usatoday.com/topics/site/weather/storms/hurricanes/1>

Outlook:

Sunny and pleasant for the weekend with a slight chance for scattered showers. Chance for showers late Sunday and into Monday. Dry with seasonal temperatures for much of next week.

Further Information:

For older versions of the "Minnesota WeatherTalk" newsletter go to

<http://www.climate.umn.edu/weathertalk/>

For access to other information resources go to

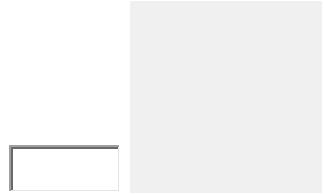
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Minnesota WeatherTalk Newsletter for Friday, August 26, 2011

To: MPR Morning Edition Crew

From: Mark Seeley, University of Minnesota Extension

Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, August 26, 2011

Headlines:

- Wide disparity in August rainfall
- Huge drop in dewpoints
- State Fair weather trivia
- Weekly Weather Potpourri
- MPR listener question
- Almanac for August 26th
- Past Weather
- Outlook

Topic: Wide disparity in state rainfall this month

Thunderstorms have delivered large amounts of rainfall in northern and central areas of the state this month with many observers reporting monthly totals that already exceed average historical monthly values. Some of these reports include: 8.83" at Litchfield, 7.63" at Floodwood, 6.66" at Collegeville, 5.71" at Wright, 5.40" at Grand Rapids, 5.27" at Mora, 5.25" at Duluth, 5.23" at St Cloud, and 5.22' at Brainerd.

Conversely, many southern Minnesota observers have reported significant rainfall deficiencies for the month of August. Less than one inch has been reported from several areas, and in southwestern Minnesota communities like Worthington and Marshall have reported less than half an inch, which has put some moisture stress on maturing corn and soybean crops.

Topic: Huge drop in dewpoints over a 12-hour period

With the passage of a relatively dry cold front overnight on August 24th, dewpoint readings dropped from the very uncomfortable 70s F into the 50s F. In the Twin Cities the 1:00 am dewpoint was a record high of 75 degrees F (with 85 percent relative humidity), but by 1:00 pm it had dropped to 50 degrees F (with 35 percent relative humidity). Similarly at New Ulm the dewpoint dropped from 70 degrees F to 43 degrees F, and at Winona it dropped from 72 degrees F to 46 degrees F, producing natural air conditioning from the drier air.

Topic: State Fair Weather Quiz and Weather Trivia

This was the 15th and final year for MPR's Gary Eichten and I to do the Minnesota Weather Quiz during the "Midday Broadcast" on the first day of the State Fair. Gary will be retiring on January 20, 2012. As such I tried to make the quiz easy so Gary would pass it. He did pass the test this year.....Hooray! One of the questions he got right.....

"The blizzard of December 10-11, 2010 brought a record 17.1 inches of snowfall to the Twin Cities and 23 inches to Winona. Which of the following disruption and damage was blamed on this storm?

- a.Cancellation of the Holidazzle Parade in Minneapolis
- b.Collapse of the Metrodome roof
- c.Closure of the MSP International Airport
- d.All of the above

You can take the complete weather quiz online at.....

<http://minnesota.publicradio.org/features/2011/08/25-weather-quiz/index.shtml>

Last year's 12 day run at the State Fair was warm over the first weekend, then cooler than normal for the closing weekend. It rained on three days and was windy on several days during the Fair. Some historical State Fair climate records include:

Coldest temperature: 36 F on September 1, 1974

Hottest temperature: 97 F on August 24, 2003 and September 1, 1913

Most rainfall: 6.39 inches in 1977

Highest dewpoint: 77 F on August 28, 1955

Most days with 90 F or higher: 10 days in 1983

Most dominant wind direction during the Fair: south-southwest winds

Weekly Weather Potpourri:

Earlier this week the National Weather Service reported that both Wichita Falls, TX and Grandfield, OK have recorded 87 days with 100 degrees F or greater since April 1st. These are new records for the number of days in a year with 100 F temperature readings. Many locations in Texas and Oklahoma report similar records for this year. A brief climate summary of these hot days for various cities can be found at....

<http://www.srh.noaa.gov/srh/climate/?n=100degree2011>

The NOAA National Hurricane Center was releasing advisories on Hurricane Irene which was expected to impact the mid-Atlantic and Northeastern States over the weekend, perhaps bringing rainfall amounts of 6 to 10 inches to some areas.

Hurricane Irene is a large and strong hurricane that is expected to bring not only heavy rains, but strong winds and significant storm surge to coastal communities. NOAA has released a hurricane survival guide that is available as a video over the web. You can find it at...

<http://oceantoday.noaa.gov/hurricanesurvival/welcome.html>

Super Typhoon Nanmadol off the north coast of the Philippines was expected to strengthen as it headed towards Okinawa over the weekend. Wind speeds were near 150 mph with gusts to 180 mph producing high seas (32 ft) and heavy rains. This dangerous storm may head towards Japan next week. Tropical Storm Talas was already off the south coast of Japan and was expected to strengthen as well.

NASA scientists reported this week on the satellite-based measurements of global sea levels since 1990. Much of the variation in the data is due to thermal expansion and contraction associated with El Nino and La Nina events in the equatorial Pacific Ocean. You can read more about it at...

<http://www.sciencedaily.com/releases/2011/08/110824132957.htm>

A recent paper by Columbia University's Earth Institute reported in the journal Nature describes a correlation between civil unrest in tropical countries and historical

episodes of El Nino. Investigators studied 234 civil conflicts in 175 countries between 1950 and 2004. Overall El Nino was associated with 21 percent of these conflicts (48). Such episodes cause problematic climate patterns in many tropical countries. You can read more about this study at...

<http://www.sciencedaily.com/releases/2011/08/110824131527.htm>

MPR listener question: We live in Mendota Heights and we had another windy day on Wednesday this week which emptied all the seed out of one of my bird feeders. It seems that we have had more windy days this year than any year I can remember. Is this true?

Answer: Yes, checking the data from the MSP International Airport shows there have been 64 days so far this year with wind gusts of 30 mph or greater compared to an average of 35-40 days. Indeed, April and May each produced 12 days with wind gusts that high, while we have had 5 such days so far in August, one with a peak wind gust of 49 mph.

Almanac for August 26th:

The average MSP high temperature for this date is 78 degrees F (plus or minus 8 degrees standard deviation), while the average low is 59 degrees F (plus or minus 7 degrees standard deviation).

MSP Local Records for August 26th:

MSP weather records for this date include: highest daily maximum temperature of 94 degrees F in 1948; lowest daily maximum temperature of 61 degrees F in 1914 and 1940; lowest daily minimum temperature of 44 degrees F in 1964 and 1968; highest daily minimum temperature of 75 degrees F in 1991; record precipitation of 2.04 inches in 2005; no measurable snowfall has been recorded on this date.

Average dew point for August 26th is 59 degrees F, with a maximum of 75 degrees F in 1973 and a minimum of 35 degrees F in 1934.

All-time state records for August 26th:

Scanning the state climatic data base: the all-time high for this date is 103 degrees F at Luverne (Rock County) and at Pipestone (Pipestone County) in 1973; the all-time low is 23 degrees F at Roseau (Roseau County) in 1915. The all-time record precipitation amount for this date is 6.72 inches at Stewart (McLeod County) in 1994. No measurable snowfall on this date in Minnesota.

Past Weather Features:

August 26, 1915 brought a killing frost (23-30 F temperatures) to many central and northern counties in Minnesota. This was an exceptionally early killing frost even for northern agricultural counties. As a result some corn, potatoes, beans, and cucumber crops were damaged.

Over August 25-26, 1955 strong thunderstorms moved across much of Minnesota, dropping hail and causing some power outages. Heavy rains caused some street flooding and basement flooding in some communities. New rainfall records were set at Ottertail (5.60"), Ft Ripley (5.52"), Milaca (5.38"), Wadena (5.25"), Long Prairie (4.52"), Cambridge (4.42"), and Bricelyn (4.33").

Strong thunderstorms again moved across the state over August 25-26, 2005 delivering up to 1.75 inch diameter hail, wind gusts up to 75 mph, and heavy amounts of rainfall which flooded streets. Some of the larger rainfall amounts included 5.03 inches at New London, 5.02 inches at Glenwood, 4.98 inches at Benson, and 4.40 inches at Alexandria.

Outlook:

Sunny and pleasant on Saturday with near average temperatures. Increasing cloudiness on Sunday with a chance for showers and thunderstorm later in the day. Warming up by the middle of next week with a chance for showers again by Wednesday and Thursday.

Further Information:

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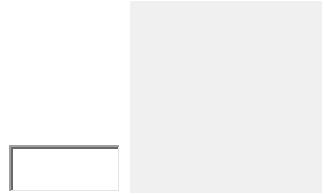
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Minnesota WeatherTalk Newsletter for Friday, September 2, 2011

To: MPR Morning Edition Crew

From: Mark Seeley, University of Minnesota Extension

Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, September 2, 2011

Headlines:

- Preliminary August climate summary
- Hot start to September
- Clean Water Summit next week
- Weekly Weather Potpourri
- MPR listener question
- Almanac for September 2nd
- Past Weather
- PTSD
- Outlook

Topic: Preliminary Climate Summary for August

Most observers reported an average August temperature that was 1 to 3 degrees F warmer than normal. The highest reading was from Canby on the 24th with 95 degrees F, while the lowest was 34 degrees F on the 21st at Embarrass. Some northern Minnesota communities reported a few morning lows in the 30s F.

August rainfall was highly variable around the state. It was generally less than normal for most Minnesota weather observers. A few exceptions included Itasca State Park, Halstad, Alexandria, Bemidji, Brainerd, and Mora, all reporting well over 4 inches. Collegeville reported nearly 7 inches of rainfall, while Litchfield reported nearly 9 inches. Southern Minnesota counties were dry, with some observers reporting less than half an inch for the month, and some crops were showing signs of stress.

August was a windy month, as many observers reported several days with wind gusts over 30 mph.

Topic: Hot start to September will be short-lived

On Thursday, September 1st dozens of Minnesota weather observers reported high temperatures in the lows 90s with dewpoints in the 70s F, producing Heat Index values from 100 degrees F to 105 degrees F. This is problematic for those who have to spend a prolonged time outside. Thankfully, the spell of heat and humidity will be short-lived as temperatures are expected to fall off into the 70s and 60s F over the weekend, and dewpoints will fall back into the 50s F. In fact northern Minnesota communities could expect to see temperatures fall into the high 30s F by Sunday night!

Topic: Annual Clean Water Summit

The University of Minnesota Landscape Arboretum in Chaska, MN will host the Annual Green Infrastructure and Clean Water Summit next week on September 8th. Topics will include the deployment and value of trees in the urban landscape. More information can be found at.....

<http://www.arboretum.umn.edu/2011greeninfrastructurecleanwater.aspx>

Weekly Weather Potpourri:

Assessment of the damages inflicted by Hurricane Irene last week is yet to be completed (current estimates range from \$7 to \$13 billion). Economic loss will likely be very significant in some states. It appears that most of the damage was due to flooding as 8 to 12 inches of rainfall was pretty widespread across the east coastal communities.

NOAA reported this week that parts of Texas continue to accumulate a record number of 100 degrees F days. Wichita Falls is now up to 95 days, San Angelo is up to 93 days, Waco has reached 79 days, and Dallas-Fort Worth sits at 65 days. Perhaps the

last such day is in sight as temperatures are supposed to tail off into the 80s and 90s after Saturday and stay in that range for several days.

The Joint Typhoon Warning Center in the Pacific forecasts that Kyoto, Japan will likely be affected by Tropical Storm Talas this weekend. The storm is expected to bring heavy rain, strong winds (60 mph), high tides, and high seas (40 ft waves) to coastal areas.

The NOAA National Hurricane Center forecasts that Tropical Depression 13 may become a tropical storm in the next day or so and bring strong winds and heavy rainfall to the southeastern Gulf states. There is the potential for 10 to 15 inch rainfall amounts to occur in parts of LA, MS, and AL over the weekend. Some rainfall may bring relief to east Texas communities as well.

MPR listener question: Now that September has started can you tell me when was the earliest measurable snowfall in Minnesota, and what has been the greatest September snowfall in the state?

Answer: The earliest measurable September snowfall was 0.3 inches at International Falls on September 14, 1964. Far and away the greatest September snow storm occurred on September 26, 1942. Starting out as rain, turning to sleet, and then a snow storm, the heaviest amounts occurred in west central Minnesota. Sauk Center reported 9 inches of snowfall, Bird Island reported 8 inches, and Long Prairie reported 7.5 inches, while Detroit Lakes and Willmar reported 6 inches of snowfall. The heavy, wet snow broke the limbs off many trees which had not yet shed their leaves for the fall. The snow was short-lived as temperatures warmed into the 60s and 70s F the last two days of the month.

Almanac for September 2nd:

The average MSP high temperature for this date is 78 degrees F (plus or minus 8 degrees standard deviation), while the average low is 58 degrees F (plus or minus 7 degrees standard deviation).

MSP Local Records for September 2nd:

MSP weather records for this date include: highest daily maximum temperature of 97 degrees F in 1937; lowest daily maximum temperature of 55 degrees F in 1952; lowest daily minimum temperature of 42 degrees F in 1974; highest daily minimum temperature of 76 degrees F in 1953; record precipitation of 1.97 inches in 2000; no measurable snowfall has been recorded on this date.

Average dew point for September 2nd is 56 degrees F, with a maximum of 75 degrees F in 1961 and a minimum of 29 degrees F in 1974.

All-time state records for September 2nd:

Scanning the state climatic data base: the all-time high for this date is 103 degrees F at Beardsley (Big Stone County) in 1929. The all-time record low for this date is 22 degrees F at Sawbill Camp (Cook County) in 1935. The all-time record precipitation amount for this date is 5.91 inches at Halstad (Norman County) in 1957. No measurable snowfall on this date in Minnesota.

Past Weather Features:

A heat wave gripped the state on September 2, 1925. Four Minnesota communities reached 100 degrees F that day. For New Ulm and St Peter it was the first of three consecutive days of 100 degrees F readings.

Another three-day heat wave prevailed over September 1-3, 1929, bringing 100 degrees F or higher to parts of western Minnesota. A strong cold front on the 3rd dropped the temperature at Montevideo from 95 degrees to 47 degrees F.

Heavy thunderstorms produced flash flooding in parts of the Red River Valley on September 2, 1957. Many observers reported 3 to 6 inches of rain as drainage ditches filled up and some roads washed out. Small grain harvesting activity was halted for several days.

September 1, 1974 brought an early and killing frost to many areas of Minnesota. Frost damaged crops in many western and southern Minnesota counties. Even Zumbrota in southeastern Minnesota dropped to 32 degrees F inflicting damage on immature corn.

Word of the Week: PTSD

Though not commonly associated with weather Post Traumatic Stress Disorder (PTSD) is certainly worth a mention this week given the numbers of people affected by Hurricane Irene. Next to war and perhaps serious traffic accidents, the trauma brought by natural disasters impacts more people than anything else. Recovery from such trauma is slow, probably more so mentally and emotionally, than physically. Often times trauma brought by a specific weather event such as a hurricane, forever leaves an emotional brand on the memory that is triggered whenever a similar threat reappears. Fortunately PTSD is treatable and will probably be required for a number

of Irene victims, especially those in NC, VT, and NY. In some cases such treatment may take longer than rebuilding the infrastructure that was destroyed.

Outlook:

Chance of scattered showers early Saturday in some areas, but generally cooler and drier over the weekend. Daytime highs will be in the 60s and 70s F, with lows in the 40s and 50s F, some 30s F in the far north. Dry and cool much of next week, with a slow warming trend towards next weekend.

Further Information:

For older versions of the "Minnesota WeatherTalk" newsletter go to

<http://www.climate.umn.edu/weathertalk/>

For access to other information resources go to

<http://www.climate.umn.edu/Seeley/>

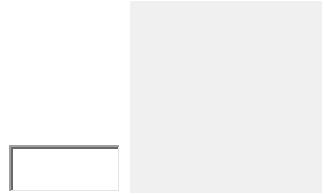
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Minnesota WeatherTalk Newsletter for Friday, September 9, 2011

To: MPR Morning Edition Crew

From: Mark Seeley, University of Minnesota Extension

Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, September 9, 2011

Headlines:

- Some early September frost
- Dryness expands across southern Minnesota
- Wrestling with a new wind speed record
- Weekly Weather Potpourri
- MPR listener question
- Almanac for September 9th
- Past Weather
- Outlook

Topic: Some early September frosts

The lower dewpoints and milder temperatures this week have been welcomed by most Minnesota citizens. But, for some northern residents the cooler temperatures brought an end to the growing season. Over September 5-6 (Mon-Tue) this week frost occurred in a number of locations, including: Big Fork (32 F), Hibbing (32 F), Orr (32 F), International Falls (31 F), Cook (30 F), Isabella (29 F), Crane Lake (28 F), Brimson (28 F), and Embarrass (26 F).

Topic: Dryness expands across southern Minnesota

According to the U.S. Drought Monitor (Lincoln, NE) dryness has expanded across southern Minnesota counties in the past few weeks. Some areas now border on moderate drought. Over the past six weeks (since August 1st) a number of observers report only about 1 inch of rainfall or less, putting them 3 to 4 inches below normal. Furthermore it looks like this dry weather pattern will persist at least until the end of September.

Topic: Wrestling with a new state wind speed record

During the early morning hours of September 1, 2011 a severe thunderstorm was passing over northwestern Minnesota. Shortly after 3 am the Road Weather Information System managed by Mn/DOT in Donaldson near the Kittson and Marshall County line registered a wind gust of 121 mph. This measurement was substantiated by damages inflicted in the surrounding landscape by such strong winds. Since that time the National Weather Service, Minnesota State Climatology Office, and National Climatic Data Center have been trying to determine if this measurement represents a new Minnesota state record for wind speed. The old state record wind speed was 117 mph from a thunderstorm near Alexandria, MN back on July 19, 1983.

There are many problems associated with determining a wind speed record. For example, it is estimated from earlier storm surveys in the state that winds stronger than 120 mph have been associated with some tornadoes in the state. But an instrumental record of the wind speed does not exist. Secondly the wind instruments (anemometers) used over time to measure wind speed have varied in placement and precision. The elevation above ground is important in the measurement of wind speed, as is the sampling interval (3 second, 5 seconds, 30 seconds, etc). The current system used by the National Weather Service is an Ice Free Wind (IFW) sensor, called a sonic anemometer (no moving parts) and measures wind in 1 second intervals, averaging every 3 seconds. The 121 mph wind at Donaldson was measured by an R.M. Young Wind Monitor (aerovane model 05103) which is a mechanical, propeller type instrument. I think it has an accuracy of plus or minus 1 percent and a measurement range up to 224 mph (though lesser wind might destroy its mast).

Anyway we should be hearing soon about a determination on this proposed new state wind speed record.

Weekly Weather Potpourri:

Preliminary NOAA data suggest that Texas measured its warmest summer in history with an average state temperature for June through August of 86.8 degrees F. In

addition Louisiana, New Mexico, and Oklahoma have reported their warmest summer. Oklahoma was just behind Texas with an average of 86.5 degrees F. Both TX and OK also reported their warmest month of August since statewide records began in 1895. You can read more about the summer climate summaries at....

http://www.noaanews.noaa.gov/stories2011/20110908_auguststats.html

http://www.cnn.com/2011/US/09/08/weather.record.heat/index.html?hpt=hp_t2

The NOAA National Hurricane Center was tracking Tropical Storm Maria, Tropical Storm Nate, and Hurricane Katia this week. Katia with winds up to 85 mph is expected to stay out over the North Atlantic and dissipate later in the weekend. Tropical Storm Maria is expected to move towards the Bahamas and Atlantic coast of Florida by the middle of next week. Tropical Storm Nate is expected to pick up strength and turn into a hurricane as it moves north through the Gulf of Mexico. It may bring some rainfall to southern Texas by Tuesday of next week.

The news media from Japan report that damages from Typhoon Talas last weekend were the worst from such a storm since 2004. Forty deaths were reported and more than 50 people were missing. Flooding and landslides caused a good deal of damage. Fortunately the western Pacific Ocean was relatively quiet this week.

Heavy rains in Pennsylvania caused flooding this week. The National Weather Service in that state reported some incredible rainfall amounts over the period September 4-8 including 14.70 inches at Pine Grove, 15.20 inches near Elizabethtown, and 13.30 inches at Harrisburg. Many communities along the Susquehanna River were evacuated because of the flood threat.

MPR listener question: Can you provide any remarks about peak fall colors this year around the state?

Answer: Dryness in northeastern Minnesota may induce earlier than normal color change there. In fact the DNR reports 10-25 percent color change already up around Voyageurs National Park, Lake Vermilion, and along the Canadian border in St Louis and Lake Counties. Also, there are signs of color change in the drier areas of south-central Minnesota like Blue Earth, Faribault, and Nicollet Counties. I suspect with the warm weather coming up for the weekend and early next week, color onset elsewhere will be slow, perhaps showing more progress by next weekend. You can get regional fall color updates from the DNR web site at....

http://www.dnr.state.mn.us/fall_colors/index.html

Incidentally, there is a nice article about fall color along Hwy 38 between Grand Rapids and Effie in north-central Minnesota. You can find the article in the current issue of the Minnesota Conservation Volunteer magazine.

Almanac for September 9th:

The average MSP high temperature for this date is 75 degrees F (plus or minus 9 degrees F standard deviation), while the average low is 56 degrees F (plus or minus 8 degrees standard deviation).

MSP Local Records for September 9th:

MSP weather records for this date include: highest daily maximum temperature of 95 degrees F in 1947; lowest daily maximum temperature of 55 degrees F in 1929; lowest daily minimum temperature of 38 degrees F in 1883; highest daily minimum temperature of 76 degrees F in 1931; record precipitation of 1.79 inches in 1900; no measurable snowfall has been recorded on this date.

Average dew point for September 9th is 55 degrees F, with a maximum of 75 degrees F in 1964 and a minimum of 33 degrees F in 1976.

All-time state records for September 9th:

Scanning the state climatic data base: the all-time high for this date is 105 degrees F at Beardsley (Big Stone County) in 1931. The all-time record low for this date is 22 degrees F at Argyle (Marshall County) and Roseau (Roseau County) in 1917, at Tower (St Louis County) in 1975, and again at Tower in 1995. The all-time record precipitation amount for this date is 4.75 inches at Gunflint Lake (Cook County) in 1977. No measurable snowfall on this date in Minnesota.

Past Weather Features:

About 5:00 pm on September 9, 1884 an F-4 tornado (winds 206-260 mph) started moving 45 miles across portions of eastern Minnesota and western Wisconsin. This storm flattened forests and destroyed many farms. Many buildings around Marine on the St Croix were damaged as well. In all four people were killed and 75 people were injured.

Remnants of the moisture plume from the famous Galveston Hurricane of September 8, 1900 brought abundant rainfall to portions of Minnesota on September 9-10, 1900. Over 2 inches of rain fell in St Paul and Minneapolis, while Willmar, St Cloud, and

Deephaven reported over 3 inches. Bird Island in Renville County received over 5.5 inches of rain.

September 9, 1931 brought 100 degrees F or higher to many western and southern Minnesota communities. For some it was the middle of the most intense 6-day heat wave to ever hit the state in September. Crops suffered and yields were quite low. September of 1931 proved to be the 2nd warmest in Minnesota history, averaging nearly 7 degrees F warmer than normal.

Outlook:

Nice weekend, with above normal temperatures and sunny skies. May even push the upper 80s to near 90 F on Monday. Increasing clouds later on Monday and into Tuesday next week with a chance for showers and thunderstorms. Much cooler temperatures by the middle of next week, but continuing dry.

Further Information:

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Minnesota WeatherTalk Newsletter for Friday, September 16, 2011

To: MPR Morning Edition Crew

From: Mark Seeley, University of Minnesota Extension

Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, September 16, 2011

Headlines:

- Fire weather
- Widespread frost and freeze
- Weekly Weather Potpourri
- MPR listener question
- Almanac for September 16th
- Past Weather
- Calm
- Outlook

Topic: Fire weather

The spread of the Pagami Creek Fire in the BWCA this week was certainly assisted by the weather. A dry air mass with dewpoints only in the 20s and 30s F (15-20 degrees less than normal for this time of year) dominated the landscape earlier this week. Then modest southerly winds turned to strong northwesterly winds with gusts from 30 to 40 mph, allowing flames to jump gaps in the forest and ignite other canopies and understory materials. Fortunately light rains over the 13th and 14th

abated faster and further spread of the fire, still one of the largest (over 100,000 acres) in Minnesota history.

The MODIS sensor aboard NASA's Terra Satellite captured the Pagami Creek Fire as it grew earlier this week and produced some pyrocumulonimbus cloud forms. You can view the images at...

<http://earthobservatory.nasa.gov/IOTD/view.php?id=52130&src=imgrss>

Topic: Widespread frost and freeze on September 15th, and again on the 16th

The dry air, cloudless sky, and low wind dropped the temperatures Thursday morning to record setting values in many Minnesota communities. Some new records were set or tied, including:

19 degrees F at International Falls
19 degrees F at Embarrass
19 degrees F at Wannaska
23 degrees F at Waskish
24 degrees F at Park Rapids
28 degrees F at Browns Valley
25 degrees F at Bemidji and Fosston
28 degrees F at Crookston (tied record low)
20 degrees F at Hibbing
23 degrees F at Kabetogama
24 degrees F at Orr
21 degrees F at Crane Lake
22 degrees F at Tower
36 degrees F at MSP Airport (tied record low)
31 degrees F at Forest Lake
29 degrees F at Eau Claire, WI
27 degrees F at Little Falls
31 degrees F at Rochester
26 degrees F at Wadena
28 degrees F at Waseca
29 degrees F at Zumbrota and Theilman

The reading of 19 degrees F at International Falls, Wannaska and Embarrass is only 2 degrees F warmer than the statewide record for September 15th of 17 degrees F at Bigfork in 1964. That reading was also lowest in the nation for September 15th. Because of the number of record setting low temperature values it is safe to say that

September 15, 2011 was one of the coldest in Minnesota history (along with 1873, 1964, and 1984).

Light to calm winds and clear skies over northern sections of the state allowed record low temperatures to occur again on the morning of Friday, September 16th. Those reporting new record lows included:

Hibbing with 22 degrees F

Crane Lake and International Falls with 23 degrees F

Ely, Kabetogama, and Orr with 23 degrees F

Bigfork with 25 degrees F

In addition observers at Ely and Dultuh reported traces of snowfall on September 14th, very early at both locations.

Weekly Weather Potpourri:

NOAA scientists announced this week that globally August of 2011 was the 8th warmest since 1880. This combines the land and ocean temperature records.

Exceptions were Scotland and Northern Ireland which recorded one of their coolest months of August. You can read more at...

http://www.noaanews.noaa.gov/stories2011/20110915_globalstats.html

NOAA-National Hurricane Center was tracking Hurricane Maria well off the coast in the North Atlantic Ocean. It was perhaps expected to bring heavy rains and winds to coastal Canada early in the weekend. In the western Pacific Ocean Tropical Storm Roke was producing winds up to 60 mph with sea waves of 18 ft over the waters south of Japan. Another Tropical Storm (Sonca) was producing winds up to 70 mph and sea waves up to 14 ft in the waters southeast of Tokyo. It was expected to dissipate early next week.

The BBC reported this week that Karachi, the commercial hub of Pakistan, and surrounding areas were hit by torrential monsoon rains and flooding this week. Millions of people have been displaced by the floods. You can read more at...

<http://news.bbc.co.uk/weather/hi/news>

NASA scientists reported this week that a meteor, probably between the diameter of a baseball and a basketball, was the cause of a beautiful light show witnessed by many observers across the southwestern USA on Wednesday night (Sept 14) this week. The

meteor exhibited some brilliant blue, green, and orange colors as it burned up in the Earth's atmosphere. You can read more about it at...

<http://www.sciencedaily.com/releases/2011/09/110915183045.htm>

MPR listener question: Is it unusual to have serious wildfires in Minnesota during September?

Answer: Actually, many of our worst historical fires have occurred during the fall season. The great Hinckley Fire of 1894 was in September, and the great Cloquet Fire of 1918 was in October. In the Pioneer Era wildfires were common in the fall season as the prairie grasses dried out. But in the modern era the frequency of wildfires in Minnesota is highest during April and May and then tails off through the summer, picking up again in October. Fall wildfires are far more common in years with summer-long drought. This year northern St Louis, Lake, and Cook Counties have been in drought all summer long. During the months of December, January and February wildfires are almost non-existent.

Almanac for September 16th:

The average MSP high temperature for this date is 71 degrees F (plus or minus 9 degrees F standard deviation), while the average low is 52 degrees F (plus or minus 8 degrees standard deviation).

MSP Local Records for September 16th:

MSP weather records for this date include: highest daily maximum temperature of 94 degrees F in 1955; lowest daily maximum temperature of 50 degrees F in 1916; lowest daily minimum temperature of 38 degrees F in 1873; highest daily minimum temperature of 74 degrees F in 1955; record precipitation of 1.97 inches in 1997; no measurable snowfall has been recorded on this date.

Average dew point for September 16th is 49 degrees F, with a maximum of 71 degrees F in 1992 and a minimum of 29 degrees F in 1937.

All-time state records for September 16th:

Scanning the state climatic data base: the all-time high for this date is 101 degrees F at Montevideo (Chippewa County) in 1891. The all-time record low for this date is 17 degrees F at Karlstad (Kittson County) in 1973. The all-time record precipitation amount for this date is 7.07 inches at Red Wing (Goodhue County) in 1992. No measurable snowfall on this date in Minnesota.

Past Weather Features:

Temperatures were in the 20s and 30s F on September 16, 1873. There were multiple killing frosts that month, bringing an early end to the growing season in southern Minnesota counties.

A September heat wave dominated the state on September 16, 1891. Many communities reported temperatures in the 90s F, including 92 degrees F in the Twin Cities. Montevideo saw 9 consecutive days with high temperatures of 90 F or greater (Sep 15-23), including 101 degrees F on the 16th and 100 degrees F on the 18th. It was their hottest September on record.

A 4-day heat wave gripped the state over September 15-18, 1955. Many observers reported temperatures in the 90s F during the day and lows in the 60s and 70s overnight. Fortunately by the 19th temperatures fell off into the 40s and 50s F.

Between 4:00 and 5:00 am on the morning of September 16, 1962 two tornadoes touched down in Olmsted County. The first struck near Rochester, and was on the ground for 1 mile. It destroyed four homes and damaged seven others, leaving 34 people injured. This tornado was rated F-4 (winds 207-260 mph). The second, weaker tornado (F-2, winds 113-157 mph) struck near Pleasant Grove in Olmsted County. It was on the ground for 4 miles and destroyed five barns, while damaging two homes. These storms were very unusual for the early morning hours.

Freezing temperatures invaded northwestern Minnesota counties on September 16, 1973. Many observers in the Red River Valley reported temperatures in the teens and 20s F. Fortunately most of the rest of the state was under cloud cover and spared from any frost.

Two rounds of thunderstorms brought flash flooding to eastern parts of the state on September 16, 1992. Red Wing reported over 7 inches of rainfall, Farmington over 6 inches, and Hastings over 5 inches. Many other observers reported 4-5 inches of rainfall which flooded roads and some basements.

Word of the Week: Calm

A demeanor of the atmosphere around us that produces no perceptible wind. For well over a century the definition of a calm was when smoke is observed to rise vertically or the sea surface is mirrorlike. In the modern context with instrumentation to measure wind speed, a calm is generally defined by a wind speed of less than 3 knots (3.5 mph).

In the Twin Cities calm conditions comprise but a small fraction of the annual wind distribution, less than 7 percent of all observations show calm conditions. The peak time for calm conditions occurs at night. During the summer months, calm conditions may prevail from midnight to 6 am about 20 percent of the time or 1 day in 5. However, during the other seasons overnight calms occur only about 10 to 15 percent of the time. During the daytime hours, calms are very infrequent, most often less than 5 percent of the time.

Outlook:

Increasing cloudiness and warmer temperatures over the weekend. There will be a chance of showers and thunderstorms late Saturday and into Sunday. Mild much of next week with a chance for showers Tuesday and Wednesday.

Further Information:

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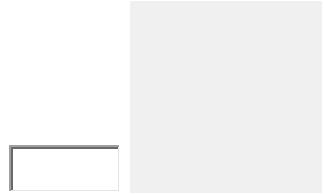
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Minnesota WeatherTalk Newsletter for Friday, September 23, 2011

To: MPR Morning Edition Crew

From: Mark Seeley, University of Minnesota Extension

Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, September 23, 2011

Headlines:

- Windy Sept 21st starts a cool down
- Nation's coldest
- Last week's frost
- Weekly Weather Potpourri
- MPR listener question
- Almanac for September 23rd
- Past Weather
- Outlook

Topic: Windy September 21st starts a cool-down

A cold front crossed the state overnight on September 20th and into early morning on the 21st bringing some very strong winds. Many areas reported wind gusts over 30 mph, and several reports winds over 40 mph. Canby in western Minnesota saw wind gusts exceed 50 mph. Wednesday, September 21st brought clouds, more strong northwest winds and very cool air to northern parts of the state. Many areas reported temperatures that were 15-20 degrees F colder than normal for the date. Warroad,

Wadena, and Bemidji measured a daily maximum temperature of only 48 degrees F, while Fosston reported a daytime high of only 46 degrees F. Fosston has only seen one colder daytime high on September 21st (44 degrees F in 1925), while similarly Wadena has only seen one colder daytime high on that date as well (47 degrees F in 1988). The cold air continued on Thursday, September 22nd holding most daytime temperature values in the 50s F. Bemidji, Fosston, Embarrass, and Babbitt only made it up to 48 degrees F on the 22nd, while Duluth reported a high of only 47 degrees F. Then on Friday morning, September 23rd International Falls, Bemidji, and Orr reported lows of 28 degrees F, while Granite Falls reported a new record low for the date of 30 degrees F.

Showers that deposited from 0.10 to 0.40 inches of rainfall over the Arrowhead on Wednesday (Sept 21) helped confine the Pagami Creek fire in that area. Additional showers, ranging from 0.10 to 0.20 inches fell on Thursday (Sept 22) as well.

Topic: Nation's lowest temperature reported three times this month

So far in September Minnesota has reported the lowest temperature in the 48 contiguous states on three dates: 19 degrees F at International Falls on the 15th; 20 degrees F at Embarrass on the 16th; and 20 degrees F again at Embarrass on the 17th.

Topic: Last week's frost

Frost over September 14-15 was widespread in many of Minnesota's primary corn and soybean producing counties. It appears that early planted corn received relatively little damage from the frost, while late planted corn and some soybeans that were still filling pods likely suffered some yield loss due to the frost. On the brighter side some of the damaged crops will likely dry down at a faster rate and perhaps in the end need less time in the drier bin before being put into storage.

Weekly Weather Potpourri:

NASA's Aquarius satellite system has provided researchers with the most comprehensive spatial view of ocean salinity yet derived. These results will be used to study the relationships among ocean currents, global rainfall, freshwater discharge, and climate variations, and should improve our knowledge base about the global water cycle. You can read more about it at...

<http://www.sciencedaily.com/releases/2011/09/110922144206.htm>

NOAA's National Hurricane Center was tracking Tropical Storm Ophelia (15th named storm of the North Atlantic season) across the North Atlantic this week. It was

expected to remain a tropical storm over the weekend, but not a threat to any islands. In the Eastern Pacific the National Hurricane Center was tracking and issuing advisories on category-3 Hurricane Hilary off the southwest coast of Mexico. It is expected to continue its westward movement over the weekend and into next week.

Researchers from the Greenland Institute of Natural Resources reported this week that bowhead whales are migrating through the unfrozen northwest passage in the Arctic. With the unusual low amount of sea ice there it is easier for them to travel long distances from Greenland to the North Pacific. You can read more about this study at...

<http://www.bbc.co.uk/news/science-environment-14976344>

NOAA announced this week their intention to build a new National Water Center on the campus of the University of Alabama Tuscaloosa. It will integrate some of NOAA's capabilities in water resource research and water supply forecasting and hopefully enhance interagency cooperation in other water resource programs. The new center will cost over \$18 million. You can read more about it at...

http://www.noaanews.noaa.gov/stories2011/20110922_nwc_construction.html

MPR listener question: This has been a very dry month here in Buffalo, MN (Wright County). We have had only 4 days with rainfall, totaling a measly 0.18 inches. I am watering the trees every other day to keep them healthy. Is this dryness very widespread?

Answer: Indeed, across much of western Minnesota the dryness is widespread. Many observers are also reporting only 4 days with rain and totals for the month so far that are less than a quarter of an inch. Unfortunately it looks like the dry weather pattern is going to persist through mid-October, so keep watering those trees.

Almanac for September 23rd:

The average MSP high temperature for this date is 68 degrees F (plus or minus 10 degrees F standard deviation), while the average low is 47 degrees F (plus or minus 8 degrees standard deviation).

MSP Local Records for September 23rd:

MSP weather records for this date include: highest daily maximum temperature of 90 degrees F in 1891 and 1937; lowest daily maximum temperature of 46 degrees F in 1965; lowest daily minimum temperature of 30 degrees F in 1983; highest daily

minimum temperature of 71 degrees F in 1930; record precipitation of 1.98 inches in 2010; there was a trace of snow on this date in 1928 and 1995.

Average dew point for September 23rd is 43 degrees F, with a maximum of 73 degrees F in 1945 and a minimum of 20 degrees F in 1928.

All-time state records for September 23rd:

Scanning the state climatic data base: the all-time high for this date is 99 degrees F at Granite Falls (Yellow Medicine County) in 1892. The all-time record low for this date is 16 degrees F at Tower (St Louis County) in 1995. The all-time record precipitation amount for this date is 9.48 inches at Amboy (Blue Earth County) in 2010. The all-time state snowfall record for this date is 2.0 inches at Bigfork (Itasca County) in 1942.

Past Weather Features:

A thunderstorm brought an all-time September daily rainfall to Fort Ripley in 1851 with 4.25 inches causing an immediate rise in the Mississippi River there.

Thunderstorms pounded the area around the White Earth Reservation in Becker County over September 23-26, 1869 bringing high winds and hail as well. Total rainfall over the four days was 12.50 inches. The monthly total rainfall for September of 1869 was a record 18.50 inches.

A brief heat wave over September 22-23, 1892 brought 90 F temperatures to many parts of western Minnesota. Fortunately temperatures fell back into the 70s F by the 24th.

Another brief heat wave occurred across western and southern counties over September 23-24, 1935 as daytime temperatures ranged into the 90s F. Rains brought relief from the heat on the 25th as temperatures dropped into the 50s and 60s F.

One of the worst flash floods in Minnesota history occurred over southern Minnesota on September 22-23, 2010 (last year) as many observers reported 9 to 11 inches of rainfall (11.06 inches at Winnebago). Basements were flooded and many roads were closed by high water. Several streams and rivers went above flood stage, including the Mississippi River at St Paul, a first for the month of September. You can read an analysis of this event at the Minnesota State Climatology Office web site:

http://www.climate.umn.edu/doc/journal/flash_floods/ff100924.htm

Outlook:

A mostly sunny weekend coming up with warmer temperatures. A general warm and dry trend should prevail across Minnesota for much of next week as high pressure dominates. The ideal weather may help farmers begin the fall harvest season where crops have matured and dried down.

Further Information:

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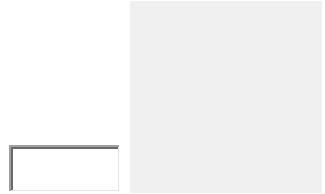
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Minnesota WeatherTalk Newsletter for Friday, September 30, 2011

To: MPR Morning Edition Crew

From: Mark Seeley, University of Minnesota Extension

Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, September 30, 2011

Headlines:

- Well wishes for Jim Zandlo, retiring Minnesota State Climatologist
- Preliminary Climate Summary for September
- Weekly Weather Potpourri
- MPR listener question
- Almanac for September 30th
- Past Weather
- Amazalert
- Outlook

Topic: Wishing Jim Zandlo a happy and healthy retirement

I don't often use Minnesota WeatherTalk to salute the career of a colleague, but in Jim Zandlo's case I have to tip my cap. Jim is retiring next week (October 5th) after a 25 year career as DNR-State Climatologist, and over 30 years with the state. Every person who works in the weather business, as well as those who use weather and climate data in their professional and personal lives owes Jim a debt of gratitude. He

has made many significant contributions to climate science and climate services in Minnesota. Too many to list really, but among his major accomplishments:

- (1)He has guided the DNR-State Climatology Office to convert all of the historical paper records of climate to electronic format for access by the public. In this effort he has made the entire state climate data base available to citizens via the DNR-SCO web site (www.climate.umn.edu)
- (2)He has built up the HIDEN rain gage network to be one of the best in the nation, with over 1500 volunteer weather observers contributing observations of rainfall and snowfall. He was one of the first state climatologists to see the value in compiling and presenting annual data reports to his observers. In recent years this network of data has greatly enhanced our understanding of snowfall patterns along the north shore of Lake Superior.
- (3)He studied non-climatic biases (placement of sensors, relocation of instruments, changes in time of observation, evolution of landscapes) that influence historical climate measurements. Further he advised NOAA-National Climatic Data Center on correction methodologies for dealing with these influences so that long-term climate measurements could be used to study trends and changes in local climate.
- (4)He examined changes in the recurrence intervals of intense rainfall events and methods to assess the influence of spatial scaling, going from point measurements (single station) to county scales, or even watershed scales in determining frequencies of flash-flood producing rainfalls.
- (5)He served as an effective advisor to state agencies and others in assessing climate change in the context of our climate history. He examined patterns of change in the historical data and took climate model output for future climate and scaled it down to a county level of detail.

Finally he left the rest of us in the climate sciences with numerous analysis tools to make better use of our rich climate historical data base. We will definitely miss him a great deal, but wish him all the best in his retirement.

Topic: Preliminary Climate Summary for September

Most Minnesota climate observers reported an average monthly temperature that was within 1 or 2 degrees of normal, either side (warmer or colder)-. Some were slightly cooler than normal (SE Minnesota for example), while others were slightly warmer than normal (central MN). Extreme temperatures for the month were: 94 degrees F at Madison, Canby, MSP, Redwood Falls, and Winona on September 1st; and just 19

degrees F at Embarrass, Wannaska, and International Falls on the 15th. Minnesota reported the nation's coldest temperature for the 48 contiguous states 4 times during the month: on the 15th, 16th, 17th, and 24th.

On the 28th (Wed) this week, International Falls set a new temperature record with a high of 82 degrees F, while a number of other Minnesota communities reported near-record values, including: 91 F at Milan, 85 F at Artichoke Lake, 82 F at Thief River Falls, and 80 degrees F at Grand Rapids.

September was a drier than normal month across nearly all of the state, especially western and southern counties. Many observers reported less than 1 inch of rainfall. One of the few observers reporting above normal rainfall was Grand Meadow in southeastern Minnesota where they had 4.27 inches. For many September, 2011 was one of the driest in history with less than half an inch of rainfall, and measurable rain on only 4-5 days during the month. Some of these included:

- 0.36" at MSP Airport (driest ever)
- 0.25" at Marshall (2nd driest)
- 0.05" at Lamberton (driest ever)
- 0.23" at Pipestone (2nd driest)
- 0.39" at Chaska (3rd driest)
- 0.41" at Wheaton (5th driest)
- 0.21" at Madison (driest ever)
- 0.34" at Browns Valley (3rd driest)
- 0.36" at Milan (4th driest)
- 0.39" at Gull Lake (5th driest)

Traces of snow were reported in NE Minnesota on the 14th.

Several observers reported multiple days with wind gusts over 40 mph. Wind gusts over 50 mph were observed on the 29th, including 55 mph at New Ulm, 56 mph at Rochester, and 53 mph at MSP. A steep pressure gradient was driving the wind across the region.

Weekly Weather Potpourri:

NOAA reports this week that Oklahoma recorded the hottest summer (June-August) ever in the USA since 1895 with an average statewide temperature of 86.8 degrees F. They also recorded the hottest month of July ever with a reading of 89.3 degrees F.

Earlier this week Typhoon Nesat killed 39 people in the Philippines as it brought heavy rain, mud slides, floods, strong winds, and high seas. It later brought severe

weather to Hong Kong and Vietnam. A second storm, Typhoon Nalgae was taking aim at the Philippines for this weekend. Packing winds up to 125 mph and seas up to 26 feet it is expected to cross north of Manila on Saturday.

In the North Atlantic Ocean NOAA's National Hurricane Center was tracking Hurricane Ophelia which is not a threat to the east coast of the USA but is expected to turn north over the weekend. They were also tracking Tropical Storm Philippe which is expected to move to a position SW of Bermuda by early next week.

A recent study by Canadian scientists finds that algal blooms are appearing in more lakes perhaps as a result of chemistry change in the lakes, via the loss of water calcium levels. You can read more about this study at...

<http://www.sciencedaily.com/releases/2011/09/110928125420.htm>

Scientists in Australia are looking for improvements in wind forecasting and assessing long term climate effects on wind. This information is needed by the growing wind energy markets to optimize the efficiency of using wind turbines. You can read more about these efforts at...

<http://www.sciencedaily.com/releases/2011/09/110926095331.htm>

MPR listener question: Thursday's winds (Sept 29) were horrific. I am sure I had 50 mph wind gusts at my place in New Hope. What is the record wind speed for September in the Twin Cities?

Answer: Indeed, 50 mph winds are unusual for the month of September unless they are downburst winds from a thunderstorm. Crystal Airport had a 52 mph wind gust on Thursday (Sept 29) and MSP International Airport reported a wind of 53 mph. The highest September wind gust I can find from MSP is 48 mph back in 2004. So a new non-thunderstorm wind speed record for the month of September was set here in the Twin Cities.

Almanac for September 30th:

The average MSP high temperature for this date is 66 degrees F (plus or minus 10 degrees F standard deviation), while the average low is 45 degrees F (plus or minus 8 degrees standard deviation).

MSP Local Records for September 30th:

MSP weather records for this date include: highest daily maximum temperature of 87 degrees F in 1897; lowest daily maximum temperature of 44 degrees F in 1985; lowest daily minimum temperature of 26 degrees F in 1939; highest daily minimum temperature of 68 degrees F in 1878; record precipitation of 1.06 inches in 2007; record snowfall is 0.10 inches in 1961.

Average dew point for September 30th is 43 degrees F, with a maximum of 66 degrees F in 1971 and a minimum of 18 degrees F in 1974.

All-time state records for September 30th:

Scanning the state climatic data base: the all-time high for this date is 93 degrees F at Montevideo (Chippewa County) in 1897. The all-time record low for this date is 10 degrees F at Big Falls (Koochiching County) in 1930. The all-time record precipitation amount for this date is 5.00 inches at Cook (St Louis County) in 1995. State record snowfall for this date is 3.0 inches at Isabella (Lake County) in 1985.

Past Weather Features:

A late September heat wave gripped parts of the state in 1897. At least 8 Minnesota communities reported daytime temperatures in the 90s F during the September 29 to October 2nd period.

The last five days of September in 1925 were wet ones for many Minnesota observers. On the 30th heavy thunderstorm rains brought 2 to 4 inches of rainfall to southern Minnesota counties putting a halt to all crop harvest activities. Worthington and Winnebago reported new daily record amounts of rain with 4.25 inches and 4.15 inches, respectively.

September 30, 1930 brought record cold to much of northern Minnesota as overnight lows ranged between 10 and 20 degrees F. Ice began to form on area lakes.

September 30, 1985 brought snowfall to at least a dozen Minnesota communities. However it was short-lived as temperatures warmed during the first week of October.

Word of the Week: Amazalert

This is an acronym for a new international project to study how climate is changing in the Amazon of South America. Scientists from 14 European and South American nations are involved in measuring and modeling climate change in the Amazon in order to document changes there and anticipate what impacts and consequences might materialize over the coming decades. You can read more about this project at...

http://www.metoffice.gov.uk/news/releases/archive/2011/amazon_project

Outlook:

Generally sunny and warmer over the weekend with a return of daytime readings in the 70s and 80s F in a number of places. Warm and dry through much of next week.

Further Information:

For older versions of the "Minnesota WeatherTalk" newsletter go to

<http://www.climate.umn.edu/weathertalk/>

For access to other information resources go to

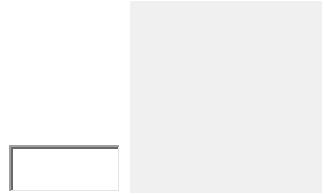
<http://www.climate.umn.edu/Seeley/>

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Minnesota WeatherTalk Newsletter for Friday, October 7, 2011

To: MPR Morning Edition Crew

From: Mark Seeley, University of Minnesota Extension

Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, October 7, 2011

Headlines:

- Some record warmth this week
- Kuehnast Lecture on October 13th features NASA scientist
- Book Events at Freshwater Society and Campus Club
- Islands in the Sun Project
- Weekly Weather Potpourri
- MPR listener question
- Almanac for October 7th
- Past Weather
- Outlook

Topic: Warm start to October

After the first week of the month it appears this October has started out warmer than any since 1963 on a statewide basis. Many observers have reported new daily maximum temperature records, as well as new warm overnight low temperature records.

Sunday, October 2nd brought temperatures in the 80s F to many western Minnesota communities including 86 degrees F at Milan, 84 degrees F at Redwood Falls, and 81 degrees F at Moorhead.

Monday, October 3rd brought a record-tying high of 82 degrees F to International Falls, and a new record high of 88 degrees F at Browns Valley.

Tuesday, October 4th brought a new record high to Pipestone with 90 degrees F, to International Falls with 82 degrees F, and to Kabetogama with 80 degrees F. Browns Valley reported a high of 86 degrees F, just two degrees shy of their record for the date.

Wednesday, October 5th brought new record highs to MSP-International Airport with 88 degrees F, downtown St Paul with 89 degrees F, Minneota with 92 degrees F, Collegeville with 86 degrees F, and Kabetogama with 80 degrees F. Rochester tied a record high with 85 degrees F.

Thursday, October 6th started out with many record warm overnight low temperatures in the 60s F. Then, during the day some locations set new daytime high records, including 81 degrees F at International Falls and 82 degrees F at Little Fork.

In addition to the warm temperatures this week relative humidity values were extremely low, especially on the 4th, 5th, and 6th. Many observers noted afternoon relative humidity in the 20 to 25 percent range and at St James in southern Minnesota it went as low as 16 percent. There were numerous reports of fires in ditches and farm fields. Farmers were harvesting corn and soybean crops and finding them to be a very low moisture content, already low enough for grain storage facilities.

Topic: 19th Annual Kuehnast Lecture on October 13th

The annual Kuehnast Lecture in atmospheric and climate sciences will take place at 3:00 pm next Thursday, October 13th in Rm 335 Borlaug Hall on the University of Minnesota St Paul Campus. This year we will hear from NASA scientist Dr. Gavin Schmidt on "What Climate Models Are Good For (and How Do We Know?).". Dr. Schmidt is a highly respected climate modeler and co-founder of the blog RealClimate.org. Anyone interested is invited to attend this lecture. More information can be found at...

http://climate.umn.edu/doc/journal/kuehnast_lecture/

Topic: Two Book Events Coming Up

On Wednesday night, October 12th the Freshwater Society in Excelsior, MN will host an evening program with the co-authors of Voyageur Skies: Weather and the Wilderness in Minnesota's National Park, Mark Seeley and Don Breneman. This event will run from 5:30 to 7:30 pm. Don and Mark will share stories, images, and weather related to this beautiful Minnesota landscape, then sell books for those interested. You can read more about this at...

<http://www.freshwater.org/>

<http://www.freshwater.org/index.php/facets-of-freshwater-december-2010/477-voyageur-skies-captures-parks-beauty-and-climate>

On October 20th, the University of Minnesota Campus Club, along with the University of Minnesota Alumni Association, and the Voyageurs National Park Association will host a Minnesota Dinner at the Campus Club in Coffman Union, from 5:30 to 7:30 pm. During the dinner Mark Seeley and Don Breneman will share stories and images from their book Voyageur Skies: Weather and the Wilderness in Minnesota's National Park. Signed copies of the book will be sold by the university book store. More information at....

<http://www.campusclubumn.org/files/Voyageur%20Skies%20Buffet%20Flier.pdf>

Topic: "Islands in the Sun"

This refers to a 4-year project undertaken by the University of Minnesota College of Food, Agriculture, and Natural Resource Sciences and Institute on the Environment to study the urban heat island effects in the Twin Cities Metro Area. Project managers Peter Snyder and Tracy Twine are still looking for volunteers to make measurements in and around the Twin Cities area. This is an important and comprehensive study of the state's major metropolitan area and you can read more about it and sign up as a volunteer by going to the web site:

<http://islands.environment.umn.edu/>

Weekly Weather Potpourri:

Yet another severe dust storm in Arizona caused a severe traffic pile-up along Interstate 10 between Tucson and Phoenix on October 5th this week. Visibility at times was near zero as the dust was driven by winds of over 35 mph at times.

The NOAA National Hurricane Center was releasing advisories on Hurricane Phillippe (North Atlantic), Tropical Storm Irwin (eastern Pacific), and a tropical depression

(eastern Pacific) this week. None of these were a threat to land, but being carefully monitored for ocean route carriers.

A report this week from the Alfred Wegener Institute for Polar and Marine Research documents the loss of old polar ice and the dominance of one-year old thinner sea ice across the Arctic Region at the conclusion of the 2011 Northern Hemisphere summer. You can read more at...

<http://www.sciencedaily.com/releases/2011/10/111006102617.htm>

MPR listener question: I observed many mid-level cumulus clouds with wisps or tails hanging from them this week, but never reaching the ground. What are these cloud forms called?

Answer: I think you were viewing virga which is common when the lower layer of the atmosphere is extremely dry as it was this week (relative humidity from 15 to 25 percent). The water droplets in the clouds grow big enough to fall, but as they fall into the drier layer of the atmosphere they evaporate well before reaching the ground.

Almanac for October 7th:

The average MSP high temperature for this date is 62 degrees F (plus or minus 10 degrees F standard deviation), while the average low is 42 degrees F (plus or minus 8 degrees standard deviation).

MSP Local Records for October 7th:

MSP weather records for this date include: highest daily maximum temperature of 85 degrees F in 1997 and 2003; lowest daily maximum temperature of 41 degrees F in 1915 and 2000; lowest daily minimum temperature of 25 degrees F in 1976; highest daily minimum temperature of 68 degrees F in 1879; record precipitation of 0.98 inches in 1904; record snowfall is a trace in 1915 and 1977.

Average dew point for October 7th is 41 degrees F, with a maximum of 68 degrees F in 1997 and a minimum of 19 degrees F in 1976.

All-time state records for October 7th:

Scanning the state climatic data base: the all-time high for this date is 94 degrees F at Canby (Yellow Medicine County) in 1993. The all-time record low for this date is 11 degrees F at Fort Ripley (Crow Wing County) in 1876. The all-time record precipitation amount for this date is 3.50 inches at Mankato (Blue Earth County) in

1931. State record snowfall for this date is 4.0 inches at Morris (Stevens County) in 1894 and at Ottertail (Otter Tail County) in 1977.

Past Weather Features:

One of the warmest first weeks of October occurred in 1879 when five of the first seven days saw daytime temperatures exceed 80 degrees F, with many overnight lows in the 60s F. Even Duluth reported many days in the 70s F. October of 1879 proved to be the 3rd warmest in Twin Cities climate history.

October 7, 1894 brought snowfall to west-central Minnesota counties. Morris reported 4 inches, 2.5 inches at Fergus Falls, and 2 inches at Milan. Fortunately temperatures rebounded into the 50s F and melted the snow after one day.

Overnight on October 6-7, 1931 heavy thunderstorms delivered one of the greatest rainfalls of the Dust Bowl Era to southern Minnesota counties. Mankato reported 3.50 inches, Waseca 2.99 inches, Zumbrota 2.75 inches, and 2.10 inches at Albert Lea.

October 7, 1976 brought record cold to many northern Minnesota communities: it was just 13 degrees F at Detroit Lakes; 14 degrees F at Wadena; 15 degrees F at Jordan; 16 degrees F at Ada, Campbell, and Red Lake Falls; 17 degrees F at Argyle, Browns Valley, Morris, Long Prairie, and Brainerd.

October 7, 1977 brought snow to parts of western Minnesota, including 4 inches at Ottertail, 3 inches at Itasca State Park, and 2 inches at Red Lake Falls.

Outlook:

Considerably cloudy over the weekend with a cooling trend. There will be a chance for showers Saturday through Monday. Continued cooling next week and chances for showers again Wednesday and Thursday.

Further Information:

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<http://www.climate.umn.edu/weathertalk/>

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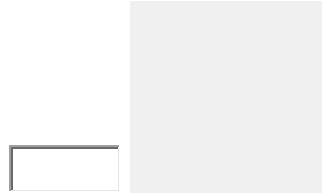
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Minnesota WeatherTalk Newsletter for Friday, October 14, 2011

To: MPR Morning Edition Crew

From: Mark Seeley, University of Minnesota Extension

Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, October 14, 2011

Headlines:

- Warmest first two weeks of October
- Nice October 12th rains
- 19th Annual Kuehnast Lecture
- Storm events of 2011
- Weekly Weather Potpourri
- MPR listener question
- Almanac for October 14th
- Past Weather
- Actinometer
- Outlook

Topic: Warmest first two weeks of October

Many Minnesota weather observers have reported the warmest first two weeks of October, averaging from 12 to 14 degrees F warmer than normal. For nearly all communities in the state October temperatures have been the warmest since either 1963 or 1938. Though temperatures are expected to decline over the next several days, another warming trend is forecast for later next week.

Topic: October 12th brings a significant rainfall

Many parts of eastern and southern Minnesota reported significant rainfall on Wednesday, October 12th. Amounts ranged primarily from 0.50 to 1.00 inches, but for many this was the greatest rainfall since September 4th. The Twin Cities recorded its greatest daily rainfall since August 16th with 0.54 inches at MSP Airport. Embarrass, located in the dry northeastern part of the state reported 1.30 inches of rainfall, the most there since June 28th. Some of the other larger amounts of rain on Wednesday included: 1.04 inches at Stillwater; 1.10 inches at Wells, 1.04 inches at Gull Lake; 1.07 inches at Caledonia; 1.64 inches at Spring Grove; and 1.84 inches at Houston.

Topic: 19th Annual Kuehnast Lecture

On Thursday, October 13th, Dr. Gavin Schmidt from NASA delivered an engaging and insightful lecture about what climate models tell us (and what they don't tell us). His lecture revealed how much climate models have improved over the years and how they help us sort out critical information needs for adapting to climate change. We hope to post Dr. Schmidt's lecture on our web site next week.

Topic: Recap of storms and strong winds in 2011

Todd Krause from the National Weather Service (Chanhassen, MN) has provided a synopsis of storm and wind events during 2011 around the state. It is not intended to be comprehensive, but his list certainly includes some of the most significant weather events in the state this year. Some of his remarks are listed below:

31 tornadoes in MN during 2011, strongest were two EF-2 storms (111-135 mph winds), one in Houston County on May 22 and one July 1st near Tyler in Lincoln County.

Largest hail reported in the state: 2.75" diameter (baseball size) in Houston County on April 10th; 3.2" diameter in Mille Lacs County on May 10th; 4.25" diameter (softball size) in Meeker County, 4" diameter in Pine County, 3.5" diameter in Benton County, 3" diameter in Stearns County, and 2.75" (baseball size) in Renville, Wright, and Sherburne Counties all on July 1st.

Most significant wind storms: July 1st in Redwood County several people reported wind damages associated with 100 mph winds; also on July 1st stations in Yellow Medicine and Renville Counties reported 70-90 mph winds; August 1st weather stations in Pope County reported winds up to 120 mph which knocked down transmission towers near Glenwood; September 1st in Kittson County a wind of 121

mph was measured; 80 mph wind in Roseau County on July 4th and near Sauk Center on July 10th; Kittson, Roseau, and Marshall Counties reported winds of 85-95 mph on July 20th; Polk County reported winds up to 90 mph on July 24th; and Big Stone County reported winds up to 95 mph on July 26th.

Weekly Weather Potpourri:

The University of Minnesota Campus Club, Alumni Association, and Voyageurs National Park Association are co-sponsoring an event at the Campus Club (4th Floor Coffman Memorial Union on the Minneapolis Campus) next Thursday, October 20th at 5:30 pm. A buffet dinner (featuring walleye and apple cider Indian pudding) will be served while photographer Don Breneman and I present photos and stories from our book *Voyageur Skies: Weather and the Wilderness in Minnesota's National Park*. It will be a fun and entertaining meeting. Reservation details and more information can be found at....

<http://www.campusclubumn.org/files/Voyageur%20Skies%20Buffet%20Flier.pdf>

Another event of interest: Don Breneman and I will do a book presentation on *Voyageur Skies* for Common Good Book Store on Monday, October 17th at 7:30 pm. The event will be held at the Swedenborgian Church at 170 Virginia St, St Paul, MN 55102. You can read more about it at the book store web site:

<http://www.commongoodbooks.com/event/don-breneman-and-mark-seeley-voyageur-skies>

The United Kingdom Met Office announced this week a new forecast service tailored to the energy sector, notably power and gas derivatives. The temperature forecasts will be oriented to anticipating energy consumption up to two weeks ahead. You can read more about it at...

<http://www.metoffice.gov.uk/news/releases/archive/2011/clearcut>

Torrential rains from tropical storms (including Hurricane Jova) drenched Nicaragua, El Salvador, and Guatemala this week, causing mudslides, floods, blocked roads, and power outages. Up to 23 storm associated deaths were reported in Central America.

This week is "Earth Science Week" sponsored by the American Geological Institute. The theme is "Our Ever-Changing Earth" and you can find information and resources for educating young people about Earth's natural processes at...

<http://www.earthsciweek.org/>

MPR listener question: Are there any records of sustained snow depth during the month of October in Minnesota? It seems that when snowfalls occur in October they are very short-lived.

Answer: There are some years when snow cover was established and permanent up in northern Minnesota counties, but certainly not in southern areas or the Twin Cities. For example in October of 1917 snow depth ranged from 2 to 8 inches at International Falls from October 18th to October 31st. Big Falls had continuous snow cover from October 23 to October 31, 1933. This is rare, as it is far more common for permanent snow cover to be established in November or December.

Almanac for October 14th:

The average MSP high temperature for this date is 62 degrees F (plus or minus 11 degrees F standard deviation), while the average low is 42 degrees F (plus or minus 8 degrees standard deviation).

MSP Local Records for October 14th:

MSP weather records for this date include: highest daily maximum temperature of 86 degrees F in 1947; lowest daily maximum temperature of 40 degrees F in 1909; lowest daily minimum temperature of 24 degrees F in 1937; highest daily minimum temperature of 66 degrees F in 1968; record precipitation of 1.89 inches in 1966; record snowfall is a trace in 1909 and 1959.

Average dew point for October 14th is 41 degrees F, with a maximum of 70 degrees F in 1962 and a minimum of 19 degrees F in 1937.

All-time state records for October 14th:

Scanning the state climatic data base: the all-time high for this date is 91 degrees F at Redwood Falls (Redwood County) in 1947. The all-time record low for this date is 8 degrees F at Beardsley (Big Stone County) in 1937. The all-time record precipitation amount for this date is 4.45 inches at Mahnomen (Mahnomen County) in 1984. State record snowfall for this date is 4.1 inches at Argyle (Marshall County) in 1992.

Past Weather Features:

October 14, 1876 marked the midpoint of a very cold week in Minnesota. In the Twin Cities area temperatures were in the low 20s F, while Duluth saw a high temperature of only 37 degrees F. A new record low was set at Fort Ripley with a reading of just 10 degrees F.

Another October cold wave prevailed on October 14, 1937. Over 20 Minnesota communities reported lows in the teens F. As far south as Grand Meadow and Rochester, the temperature dipped to 17 degrees F.

October 14, 1947 began a 4-day heat wave around the state. Over two dozen communities reported daytime temperatures in the mid to upper 80s F and a few saw the temperature reach 90 degrees F.

October 14-16, 1984 brought persistent thunderstorms to the state. Strong winds knocked down trees in Carlton and St Louis Counties, flattened crops in southeastern Minnesota, and caused power outages in many areas around the state. Heavy rainfall brought a halt to crop harvesting activity and fall tillage. Some of the remarkable 3-day rainfall totals included: 6.26 inches at Mahnomen; 6.00 inches at Gonvick; 5.75 inches at Hawley; 5.48 inches at Alexandria; 5.37 inches at Wadena; 4.99 inches at Madison; 4.84 inches at Morris, and 4.65 inches at Benson.

October 14, 1992 brought 2-4 inches of snowfall to many northern Red River Valley communities in Minnesota, temporarily halting farm work. In north central Minnesota residents of International Falls saw 7 days with snowfall that month.

Word of the Week: Word of the week: Actinometer

From the Greek "actino" meaning ray of light and "meter" meaning to measure. This is the general name for an instrument which measures the intensity of radiant energy, particularly that coming from the sun. There are at least three types: a pyroheliometer measures direct solar radiation; a pyranometer measures global radiation (the combined energy of direct and diffuse radiation); and a pyrgeometer measures terrestrial radiation (longer wave radiant energy emitted by the Earth to space).

Outlook:

Cloudy over the weekend with daytime temperatures in the 50s and 60s F. Chance for showers late on Saturday, but mostly dry Sunday. Increasing chances for showers late Monday and Tuesday next week, with cooler than normal temperatures. Then a warming trend towards the end of next week.

Further Information:

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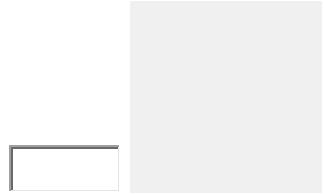
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Minnesota WeatherTalk Newsletter for Friday, October 21, 2011

To: MPR Morning Edition Crew

From: Mark Seeley, University of Minnesota Extension

Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, October 21, 2011

Headlines:

- The other shoe drops
- New Seasonal Climate Outlook
- Composting
- Weekly Weather Potpourri
- MPR listener question
- Almanac for October 21st
- Past Weather
- Outlook

Topic: The other shoe drops

After starting October with two weeks of unusual warmth, thermometers recorded below normal temperatures on many days this week, bringing another round of widespread frosts. On Thursday, October 20th some observers reported lows in the 20s F, including: 28 degrees F at Luverne, Tracy, Worthington, Grand Marais, Orr, Detroit Lakes, Fergus Falls, and Grand Rapids; 27 degrees F at Warroad and Hibbing; 26 degrees F at Embarrass; 25 degrees F at Marshall, Wheaton, Ortonville, Thief River Falls, Big Fork, Roseau, Wadena, Moorhead, and Aitkin; 23 degrees F at

Staples and Crookston; 22 degrees F at Kelliher; 21 degrees F at Pine River, Mahnomen, and Fosston; 20 degrees F at Park Rapids; 19 degrees F at Hallock, Waskish, Morris, and Bemidji. The 19 degrees F was coldest in the contiguous 48 states on October 20th.

Additional very low air temperatures were reported in Minnesota on Friday morning, October 21st. Some of these reports included: 19 degrees F at Crane Lake, International Falls, Ely, Big Fork, Orr, and Floodwood; 18 degrees F at Grand Rapids, Grand Marais, Cook, and Silver Bay; 16 degrees F at Hibbing and Babbitt; and just 13 degrees F at Embarrass (coldest in the nation).

A warming trend will take effect later on Friday and last at least through next Tuesday, and may return for the end of the month and beginning of November.

Topic: New Seasonal Climate Outlook

The NOAA Climate Prediction Center released a new seasonal climate outlook this week covering the months of December through February. CPC scientists used La Nina correlations, recent climate trends, and the exceptionally low arctic sea ice extent as weighted tools in making their predictions. For the western Great Lakes region, including Minnesota, the December through February periods is expected to be colder than normal. In terms of precipitation we are expected to be wetter than normal across the entire northern tier of states. You can read more at...

http://www.noaanews.noaa.gov/stories2011/20111020_winteroutlook.html

Topic: Composting those leaves

Have you been raking and bagging leaves recently? Seems like in many areas yards are starting to fill with them.

Many homeowners around the state compost leaves in the fall. My academic home, the Department of Soil, Water, and Climate has developed recommendations for composting and mulching of organic yard wastes, including leaves. Carl Rosen, Bob Mugaas, and Tom Halbach among others have published a guide to composting and mulching which is available from county extension offices. In addition you can find it online at the Extension Store....

<https://shop-secure.extension.umn.edu/PublicationDetail.aspx?ID=461>

Some of the more important points about composting:

Barrels, framed wire cages or wooden frames will all work well for composting.

Shredded leaves will decompose faster than whole leaves. (Basically, smaller breaks down faster than larger)

Key ingredients for compost piles include: organic waste (leaves, grass clippings, plant residues from gardens), proper aeration (stirring or mixing occasionally), moisture (periodically water the compost pile), and nitrogen (either from manure, blood meal, or fertilizer).

Depending on the amount of material, composting may take from 6 months to a year or more before you have a usable mulch.

Weather is certainly a factor in governing the speed of the composting process. Leaves placed in a compost pile early this fall will be subject to more decomposition before winter freeze up. During the winter months in Minnesota, compost piles are usually frozen and little if any biological activity occurs. Thus if you would like to use the mulched material by next summer or fall, start composting now and don't wait for the last leaf to fall.

Weekly Weather Potpourri:

An independent research team assessed global temperature trends following the "climategate" episode last year. They found global temperature trends to be similar to those already published by NASA, NOAA, and the Hadley Center. It is further justification that the published research on global temperature trends is quite valid. You can read more about this study at...

<http://www.bbc.co.uk/news/science-environment-15373071>

On Tuesday, October 18th a dust storm caused power outages and much reduced visibility in west Texas. Winds up to 70 mph were reported near Lubbock, as billboards and power lines were blown down. You can find more information at...

<http://www.bbc.co.uk/news/world-us-canada-15349653>

A tornadoes swept through parts of southeastern Florida on Tuesday night (October 18) causing power outages and knocking down trees. Associated bands of heavy thunderstorms and frequent lightning strikes caused schools to be closed in the Keys on Wednesday (October 19). Damages were especially significant in the Plantation and Sunrise areas of eastern Florida.

Heavy rains continued to plague Bangkok, Thailand this week aggravating the floods already occurring there. Monsoon rains keep developing and delivering some of the heaviest amounts of rain seen in 50 years.

NASA released a series of satellite images that show wildfires around the world since 2002. The visualizations are compiled from MODIS sensors on board the Aqua and Terra satellites. The images are used to study character, frequency and distribution of global fires and you can read more about the released images at...

<http://www.sciencedaily.com/releases/2011/10/111020025606.htm>

MPR listener question: With the 20th Anniversary of the famous Halloween Blizzard of 1991 coming up I wanted to ask what you think the weather will be like this year?

Answer: No blizzard in sight for Halloween. Actually forecast models suggest relatively warm and dry conditions for Halloween this year. Temperatures are likely to be in the 50s F with little or no precipitation. So perhaps those warm animal costumes will not be necessary, a sheeted ghost may be comfortably dressed.

Almanac for October 21st:

The average MSP high temperature for this date is 57 degrees F (plus or minus 11 degrees F standard deviation), while the average low is 39 degrees F (plus or minus 9 degrees standard deviation).

MSP Local Records for October 21st:

MSP weather records for this date include: highest daily maximum temperature of 88 degrees F in 1947; lowest daily maximum temperature of 29 degrees F in 1913; lowest daily minimum temperature of 16 degrees F in 1916; highest daily minimum temperature of 62 degrees F in 1920; record precipitation of 1.76 inches in 1894; record snowfall is a 0.10 inches in 1936.

Average dew point for October 21st is 37 degrees F, with a maximum of 64 degrees F in 1920 and a minimum of 8 degrees F in 1952.

All-time state records for October 21st:

Scanning the state climatic data base: the all-time high for this date is 91 degrees F at Redwood Falls (Redwood County) and Little Falls (Morrison County) in 1947. The all-time record low for this date is a very cold -2 degrees F at Roseau (Roseau

County) in 1913. The all-time record precipitation amount for this date is 2.35 inches at Harmony (Fillmore County) in 1982. State record snowfall for this date is 8.0 inches at Milaca (Mille Lacs County) in 2002.

Past Weather Features:

A three-day blizzard visited the state over October 18-20, 1916, one of the earliest in state history. Roseau reported 9 inches of snow, Thief River Falls received 9.7 inches, Hallock reported 13 inches, and Baudette observed 18 inches of snow. As far south as Zumbrota reported 4 inches of snow, and all crop harvesting activity was halted.

An October heat wave prevailed on the 21st in 1947. Many Minnesota communities reported temperatures in the 80s F, while five Minnesota communities reached the 90s F. October of 1947 was the 2nd warmest in state history.

A mid-October snow storm brought significant amounts to many central Minnesota communities on the 21st in 2002. Measurable snowfalls occurred across many parts of the state but especially central counties. Collegeville and Little Falls reported 6 inches, Long Prairie reported 6.5 inches, Browns Valley reported 6.3 inches, Fergus Falls reported 7 inches, and Milaca reported 8 inches. With snow on ground Milaca's temperatures remained in the 20s and 30s F for the remainder of the month.

Outlook:

Warmer temperatures over the weekend, with increasing cloudiness by Sunday. Chance of widely scattered showers on Sunday. Continued warm temperatures into next week with a chance for showers by Tuesday, then colder temperatures for Wednesday and Thursday.

Further Information:

For older versions of the "Minnesota WeatherTalk" newsletter go to

<http://www.climate.umn.edu/weathertalk/>

For access to other information resources go to

<http://www.climate.umn.edu/Seeley/>

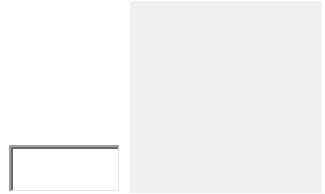
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Minnesota WeatherTalk Newsletter for Friday, October 28, 2011

To: MPR Morning Edition Crew

From: Mark Seeley, University of Minnesota Extension

Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, October 28, 2011

Headlines:

- Preliminary October climate summary
- 20th Anniversary of the Halloween Blizzard
- Gales of November Conference, Nov 4-5
- Weekly Weather Potpourri
- MPR listener question
- Almanac for October 28th
- Past Weather
- Outlook

Topic: Preliminary climate summary for October

On a statewide basis this has been a very warm October, warmest since 1963 and probably 4th warmest in history. Observers report a mean monthly temperature that is 5 to 7 degrees F warmer than average. Extremes for the month ranged from 90 degrees F at Browns Valley on the 6th to just 13 degrees F at Embarrass on the 21st.

In terms of precipitation, October was very dry, continuing a trend that started in late July. Many observers reported only 4-5 days with precipitation. Most areas had less than half normal monthly totals, and some spots reported one of the driest Octobers in

history. Included among the driest places in the state this month were: Lakefield 0.28 inches (driest ever); Zumbrota 0.46 inches (6th driest); Rochester 0.29 inches (6th driest); Minnesota City 0.60 inches (6th driest); Windom 0.29 inches (9th driest); Bemidji 0.40 inches (10th driest); Itasca State Park 0.44 inches (10th driest); and Winnebago 0.36 inches (10 driest).

The wettest spots in the state were in the northeast where Gunflint Lake reported 2.48 inches and Embarrass reported 2.08 inches.

October was windy as well. Many places reported wind gusts over 40 mph. Duluth reported wind gusts over 40 mph on four days.

Topic: 20th Anniversary of the 1991 Halloween Blizzard

Monday marks the 20th Anniversary of the famous Halloween Blizzard that shut down much of the state, and delivered some of the heaviest snowfalls in history for many cities. This long duration storm (30-60 hours) slammed the state over October 31 to November 2nd depositing from 1 to 3 feet of snow in many areas. At times snowfall deposition rates were 2-3 inches per hour. Winds gusted from 35 to 45 mph causing near zero visibility. Over 900 schools and businesses were closed by November 1st. Hundreds of motorists were stranded and some buildings were damaged by snow loads.

Residents of Austin and Albert Lea recall this event as a great ice storm which deposited a coating of 2-3 inches of ice on roads, trees, and power lines. Many were without power. The National Guard provided some emergency generators for power in some communities.

You can read more about this great storm on our web site at....

http://www.climate.umn.edu/doc/journal/halloween_blizzard_20th.htm

<http://www.crh.noaa.gov/mpx/>

Topic: Gales of November Event in Duluth, November 4-5, 2011

The 24th Annual Gales of November Event will be held at Canal Park in Duluth over November 4-5. Cathy Wurzer will be the luncheon speaker on Friday, November 4th at the Grandma Sports Garden Event Center. She will be talking about "Tales of the Road - Highway 61." Several other speakers will present at the DECC on Saturday, November 5th, including Mark Seeley at 3:30 pm. Mark will talk about "Great

November Storms of Lake Superior." For more information you can visit the following web site:

http://www.lsmma.com/activities_events/gales_november.html

Weekly Weather Potpourri:

A summary of Minnesota tornadoes during 2011 can be found at the National Weather Service web site.....there are 31 in total...

<http://www.crh.noaa.gov/mpx/?n=minnesotatornadoes2011>

Amarillo, TX reported a record 2.5 inches of snowfall on October 27th this week. The snow made driving difficult, but soon melted as temperatures warmed up to 38 degrees F.

Tropical Storm Rina was spinning off the Yucatan coast this week and expected to bring 3 to 6 inches of rainfall there, along with 1 to 2 foot storm surge. It is slow moving and expected to linger for a while as it weakens.

More than 1900 participants from 86 countries attended the World Climate Research Program held in Denver, CO this week. The audience heard about governmental, experimental, and private climate services currently available, as well as the latest in climate research. You can find the entire program listed at...

<http://www.wcrp-climate.org/conference2011/>

Torrential rainfall caused flash flooding in parts of Italy on Tuesday and Wednesday this week. The regions of Liguria and central Tuscany were hardest hit with more than 3 inches of rainfall in a 6 hour period. Rivers overflowed their banks, roads were washed out, and at least 9 deaths were blamed on the flooding.

Environment Canada released a national climate summary for the summer months of 2011. They note that the country had its 4th warmest summer and 7th wettest summer in history. It was especially unusual in arctic Canada and in Manitoba. You can read more about it at...

<http://www.ec.gc.ca/adsc-cmda/default.asp?lang=en&n=30EDCA67-1>

MPR listener question: I love skiing so most winters I am hoping for lots of snow. I see from your web site the most snowfall in one season was 170.5 inches near Grand

Portage, MN in the winter of 1949-1950. But which area of Minnesota holds the most daily snowfall records in the state? Is it also the north shore along Lake Superior?

Answer: Indeed, you have answered your own question. Based on daily snowfall records in the state Isabella (11 daily records) in Lake County, Beaver Bay in Lake County (9 daily records); Pigeon River (7 daily records) in Cook County are the places with the most daily snowfall records in our state. Yet more daily snowfall records have fallen since the establishment of the climate station at Wold Ridge Environmental Learning Center near Finland (Lake County) in 1993. They have established statewide snowfall records there for January 7th (36 inches in 1994) and March 2nd (25 inches in 2007).

Almanac for October 28th:

The average MSP high temperature for this date is 52 degrees F (plus or minus 11 degrees F standard deviation), while the average low is 35 degrees F (plus or minus 9 degrees standard deviation).

MSP Local Records for October 28th:

MSP weather records for this date include: highest daily maximum temperature of 75 degrees F in 1948; lowest daily maximum temperature of 24 degrees F in 1925; lowest daily minimum temperature of 17 in 1905 and 1925; highest daily minimum temperature of 56 degrees F in 1974; record precipitation of 1.97 inches in 1874; record snowfall is a 0.40 inches in 1895.

Average dew point for October 28th is 34 degrees F, with a maximum of 59 degrees F in 1946 and a minimum of 10 degrees F in 1925.

All-time state records for October 28th:

Scanning the state climatic data base: the all-time high for this date is 90 degrees F at Chatfield (Fillmore County) in 1927. The all-time record low for this date is a very cold -9 degrees F at Angus (Polk County) in 1919 and at Meadowlands (St Louis County) in 1942. The all-time record precipitation amount for this date is 3.10 inches at Caledonia (Houston County) in 1900. State record snowfall for this date is 9.5 inches at Big Falls (Koochiching County) in 1932.

Past Weather Features:

Ft Snelling weather observers noted prairie fires on October 28th in 1842, 1844, and 1850, all following dry Octobers. In 1861 another dry fall produced wildfires on

Dayton's Bluff overlooking St Paul, where both grass and forest fires sent billowing clouds of smoke across the downtown area on October 29th, causing many of the residents to remain indoors that day.

October 24-25, 1887 brought a cold wave to Minnesota that froze lakes overnight. Low temperatures were generally in the single digits, and many observers reported readings below zero F. Some of the lowest temperatures included: -10 degrees F at St Vincent, -8 degrees F at Argyle, and -6 degrees F at Albert Lea and Rochester.

A late season severe thunderstorm swept across southeastern Minnesota over October 27-28, 1900. La Crescent reported 4.27 inches, St Charles reported 4.25 inches of rainfall, and 3.10 inches fell at Caledonia. Railroad beds were washed out and there was a good deal of property damage reported.

Another cold wave prevailed on October 28, 1925. Many observers saw overnight lows drop into the single digits with afternoon highs only reaching the teens and 20s F.

October 25-29, 1932 brought heavy snowfall to northern Minnesota communities. Mizpah reported over 18 inches, nearly a foot of snow at Big Falls, and over 9 inches at Bemidji and Orr. With the fresh snowfall overnight temperatures fell off into the teens F.

Outlook:

Mostly sunny on Saturday, then increasing clouds with a chance for showers on Sunday. Warmer and drier by Monday and Tuesday, then another chance for showers mostly in southern sections with cooler temperatures on Wednesday and Thursday.

Further Information:

For older versions of the "Minnesota WeatherTalk" newsletter go to

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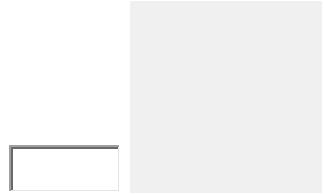
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Minnesota WeatherTalk Newsletter for Friday, November 4, 2011

To: MPR Morning Edition Crew
From: Mark Seeley, University of Minnesota Extension
Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, November 4, 2011

Headlines:

- Drought continues to develop in southern MN
- Metro Area snowfall frequency tables
- Cold November 3rd and 4th
- Weekly Weather Potpourri
- MPR listener question
- Almanac for November 4th
- Past Weather
- Outlook

Topic: Drought continues to develop in southern Minnesota

Many Minnesota weather observers in southern counties are reporting large precipitation deficiencies since July. In fact the USA Drought Monitor shows that across southern Minnesota, from Lincoln County eastward to Goodhue County and from the Iowa border north to McLeod County much of the landscape is in moderate to severe drought, especially portions of Watonwan and Martin Counties. Many observers in southwestern and south-central Minnesota have reported their driest August through October period in history. Some of the locations reporting the least

amount of rainfall over this 3-month period include: 1.93 inches at Winnebago; 1.03 inches at Marshall; 1.85 inches at Worthington; 1.35 inches at St Peter; 1.41 inches at St James; 1.30 inches at Lamberton; 1.28 inches at Windom; 1.65 inches at Fairmont; and 1.59 inches at Canby.

You can read more about this situation at the DNR-State Climatology Office web site....

http://www.climate.umn.edu/doc/journal/drought_2011.htm

Topic: New table of snowfall frequency available for the Twin Cities area

The DNR-State Climatology Office has posted a new snowfall frequency table on their web site for Twin Cities residents to use. It shows the frequency distribution of 0.1, 1, 2, 4, 6, and 8 inch snowfalls based on the 1891-2011 time period. Four inch snowfalls occur with an average of 2-3 events per season, but have been as high as 8 events in one season. Two inch snowfalls occur with an average frequency of 7-8 times per season, but have been as high as 16 events in one winter. If you want to view the data for yourselves you can go to....

http://www.climate.umn.edu/doc/twin_cities/snowmsp.htm

Topic: Coldest temperatures of the fall season on November 3rd and 4th

Many Minnesota weather observers reported their coldest readings of the fall season so far on Thursday morning (Nov 3) this week. Some of these included: 11 degrees F at Embarrass; 14 degrees F at Silver Bay; 15 degrees F at Tower; 19 degrees F at Marshall; and 16 degrees F at Orr and Pine River. These temperatures are cold enough to cause the formation of ice in shallow lakes and ponds. Hibbing was quite cold again on Friday morning (Nov 4) with just 14 degrees F, while as far south as Fairmont and Austin temperatures fell to 19 degrees F. Some moderation in temperatures will occur over the weekend.

Weekly Weather Potpourri:

Russia has decided not to "fall back" to Standard Time this year. As a result they will effectively remain on "Daylight Savings Time" throughout the northern hemisphere winter. This is based on the recommendation of their President Dmitry Medvedev who thinks it will help with energy use patterns, public safety and mental health if mornings remain dark longer, and evenings remain light longer. This will conflict with the rest of the European Community which has gone back to Standard Time, and

therefore the difference may cause some complications will travel scheduling and business communications among countries as work days will not be in sync.

The deep low pressure system that brought 8-12 inches of snowfall last weekend to much of the northeastern USA passed across the North Atlantic this week and was poised to bring some significant rains to the United Kingdom over Friday and Saturday. As much as 1-2 inches of rain was expected in some places.

Speaking of the United Kingdom, the Meteorological Office there launched a new program in conjunction with the Health Ministry to provide information resources and forecasting for a Cold Weather Plan of Action to help better protect more vulnerable residents, such as senior citizens and those with serious illness. The plan has evolved in response to the United Kingdom last year (2010) experiencing its coldest December since 1910. It is based on four-levels of alertness to the weather and you can read more about it at...

<http://www.metoffice.gov.uk/weather/uk/coldweatheralert/>

A possible break-through in solar power technology was published in Nature Communications. It involves the development of a composite trapezoid-shaped metal gratings (composed of metal and silicon oxide) at a nano-scale which are highly effective at trapping energy from the broad solar spectrum. This material may lead to far more efficient, and lower cost solar cell development. Researchers from Northwestern University in Illinois are hopeful that this nano-design technology may be a boost to the solar energy sector. You can read more at...

<http://www.sciencedaily.com/releases/2011/11/111102125555.htm>

Researchers from the University of Virginia and NOAA report this week that studies of Tropical Cyclone frequency and intensity over the Arabian Sea reveal that atmospheric pollution in the area may be having an effect. The build up of aerosols in the lower atmosphere may be contributing to less wind shear over the Arabian Sea. In this context the absence of strong wind shear allows tropical wave disturbances greater potential to build into tropical storms, which seems to be happening in recent years there. You can read more about this study at...

<http://www.sciencedaily.com/releases/2011/11/111102161147.htm>

MPR listener question: With the threat of snowfall mentioned in the forecast for next week I wondered how often does the Twin Cities get a 2 inch snowfall before mid-November? In my lifetime here it seems pretty rare.

Answer: Good question. It has happened each of the last two years. In 2009 we received 2.5 inches of snow on October 12th, while in 2010 there was 7.7 inches of snow on November 13th. However checking the climate record all the way back to 1891, snowfalls of 2 or more inches prior to November 15th occur in only one year out of every four in the Twin Cities area. So, I would say it is not rare in occurrence but occasional. It is far more common in northern communities like Bemidji and International Falls.

Almanac for November 4th:

The average MSP high temperature for this date is 48 degrees F (plus or minus 10 degrees F standard deviation), while the average low is 32 degrees F (plus or minus 9 degrees standard deviation).

MSP Local Records for November 4th:

MSP weather records for this date include: highest daily maximum temperature of 74 degrees F in 1975; lowest daily maximum temperature of 17 degrees F in 1991; lowest daily minimum temperature of -3 degrees F in 1991; highest daily minimum temperature of 51 degrees F in 1895; record precipitation of 0.61 inches in 1988; record snowfall is a 1.0 inches in 1910.

Average dew point for November 4th is 29 degrees F, with a maximum of 55 degrees F in 1956 and a minimum of -5 degrees F in 1991.

All-time state records for November 4th:

Scanning the state climatic data base: the all-time high for this date is 79 degrees F at Redwood Falls (Redwood County) in 1975. The all-time record low for this date is a very cold -13 degrees F at Warren (Marshall County) in 1919. The all-time record precipitation amount for this date is 1.84 inches at Fairmont (Martin County) in 1922. State record snowfall for this date is 15.8 inches at Isabella (Lake County) in 1982.

Past Weather Features:

November 3-4, 1909 brought a late autumn heat wave to southern Minnesota counties. Daytime temperatures set records with highs in the 70s F on both days. Lynd, Pipestone, and Redwood Falls all reached 78 degrees F, while Windom was 76 degrees F, Winnebago 74 degrees F, and St Peter reached 72 degrees F.

November 4, 1919 brought several inches of snowfall to northern Minnesota, followed by below zero temperature readings. The temperature fell to -11 degrees F at

Hallock, -7 degrees F at Crookston, -5 degrees F at Detroit Lakes, and -4 degrees F at Fergus Falls. It was the start of a long, cold, and snowy November. Duluth reported 14 days with snow and Red Lake Falls reported nearly 3 feet of snow for the month.

Another early season snow storm visited northern Minnesota residents over November 2-4, 1982. Babbitt reported a total of 22 inches, International Falls had over 7 inches, and Hibbing reported over 6 inches.

Following the great Halloween Blizzard in 1991, many Minnesota communities set new low temperature records on November 4 as arctic high pressure settled over the state. Fosston fell to -11 degrees F, Bemidji reported -9 degrees F, and Blackduck and Itasca State Park reported -8 degrees F. As far south as Caledonia (Houston County) was as cold as -1 degrees F.

Outlook:

Somewhat windy and mild on Saturday with afternoon highs in the 50s and 60s F. Increasing cloudiness with a chance of showers on Sunday, especially in western sections. Cooler temperatures with another chance for showers later next week, including rain and snow.

Further Information:

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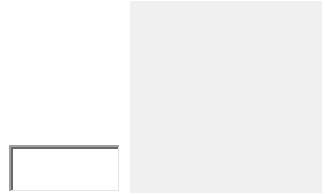
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Minnesota WeatherTalk Newsletter for Friday, November 11, 2011

To: MPR Morning Edition Crew

From: Mark Seeley, University of Minnesota Extension

Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, November 11, 2011

Headlines:

- Winter Hazard Awareness Week
- Snow this week
- Minnesota Moments
- Weekly Weather Potpourri
- MPR listener question
- Almanac for November 11th
- Past Weather
- ELOKA
- Outlook

Topic: This is Winter Hazard Awareness Week

For Winter Hazard Awareness Week the National Weather Service has released a number of public service announcements reminding us of winter weather preparation, outdoor safety tips, indoor air quality considerations, fire safety, and winter driving safety. In 4 of the last 5 years the Metro Area of the Twin Cities has seen snowfall before Winter Hazard Awareness Week is over, so the timing of this information has

been quite appropriate. The NOAA National Weather Service web site contains a good deal of useful information to consider as you prepare for winter. Please see....

<http://www.crh.noaa.gov/mpx/?n=whaw>

Topic: Snow this week

A modestly strong, but cold weather system crossed the region on Tuesday and Wednesday this week bringing some measurable snowfall to many locations. In the southeast Lanesboro and Preston reported a half inch to one inch of snow, respectively, while Caledonia reported 3.1 inches. Other observers in central and northern Minnesota also reported measurable snowfalls, including: 2.9 inches at Sawyer (Carlton County); 2.5 inches at New York Mills (Otter Tail County); 1.9 inches at Kabetogama; 1.5 inches at International Falls, Cloquet, and Bruno; 1.2 inches at Bemidji; 1.1 inches at Orr; 1.0 inches at Cook, Cass Lake, Gunflint Lake, and Floodwood. Some heavier amounts fell in Wisconsin. Additional light snowfall was observed over International Falls, Hibbing, Embarrass, and Eveleth on Friday morning as well. At Embarrass the temperature dropped to 11 degrees F on Friday.

Topic: Minnesota Moments

The current edition of Minnesota Conservation Volunteer magazine has many wonderful articles, but I especially enjoyed the photo essay on a year's worth of images across the Minnesota landscape. It is called "Minnesota Moments" and is a result of the contribution of many photographers. It begins on page 40 and I highly recommend it for those who appreciate the outdoors and Minnesota's seasons.

Weekly Weather Potpourri:

One of the strongest storms in 40 years hit western Alaska this week on Wednesday and Thursday (Nov 9-10) bringing strong winds, heavy snows, and high seas. The eye of the storm (low pressure center) bottomed out at just 943 mb (27.85 inches) as it crossed the Bering Sea and produced maximum winds of 80 to 89 mph along coastal areas. This was a stronger storm than the record-setting one that hit Minnesota last year on October 26th (28.20 inches on the barometer). At Nome, the storm surge was 10 feet and inundated some coastal properties. Without the presence of sea ice, large waves caused a good deal of beach erosion, while some of the strong winds blew the roofs off buildings. Heavy snow squalls occurred in many places, with visibility falling to near zero.

Oklahoma State Climatologist Dr. Renee McPherson reported this week that the tornadoes which occurred in that state on Monday, November 7th destroyed at least

two of their automated mesonet weather stations. This is the first instance of weather stations being taken out by tornadoes in that state. These storm events continued the trend of traumatic weather in Oklahoma this year, highlighted in a recent newspaper article there....

http://www.durantdemocrat.com/view/full_story/16368816/article-Record-breaking-year-tests-tough-Oklahomans?instance=home_news_lead

NOAA's Earth System Research Laboratory released a report on the Annual Greenhouse Gas Index (AGGI) earlier this week. It shows that the level of most greenhouse gases continued to rise throughout 2010. Carbon dioxide levels are now at 389 ppm and the overall AGGI is 29 percent higher than it was in 1990, the baseline year. You can read more about this at....

http://www.noaanews.noaa.gov/stories2011/20111109_greenhousegasindex.html

The National Snow and Ice Data Center recently announced the establishment of several automated weather stations on the eastern section of Baffin Island (Clyde River area at 70 degrees north latitude). These new stations will help with the studies of the changing climate in the Arctic. Near real-time climate measurements from these stations can be found at.....

<http://www.clyderiverweather.org/>

Temperature conditions there on Thursday, November 10 ranged from 0 degrees F to -11 degrees F at midday, with windchill conditions as cold as -35 degrees F.

MPR listener question: Are soil temperatures getting near freezing now so I can stop watering?

Answer: Not yet. Many soil temperatures around the state have fallen into the upper 30s to low 40s F, but for the most part soils remain very dry. Certainly trees could still use a watering right up until the soils freeze, which may be two more weeks or longer.

Almanac for November 11th:

The average MSP high temperature for this date is 43 degrees F (plus or minus 11 degrees F standard deviation), while the average low is 27 degrees F (plus or minus 9 degrees standard deviation).

MSP Local Records for November 11th:

MSP weather records for this date include: highest daily maximum temperature of 64 degrees F in 2005; lowest daily maximum temperature of 18 degrees F in 1986; lowest daily minimum temperature of -1 degrees F in 1986; highest daily minimum temperature of 46 degrees F in 1930; record precipitation of 2.52 inches in 1940; record snowfall is a 8.2 inches in 1940 (storm total 16.8" from Armistice Day Blizzard).

Average dew point for November 11th is 27 degrees F, with a maximum of 54 degrees F in 1964 and a minimum of -6 degrees F in 1986.

All-time state records for November 11th:

Scanning the state climatic data base: the all-time high for this date is 73 degrees F at Grand Meadow (Mower County) in 1949. The all-time record low for this date is a very cold -22 degrees F at Warren (Marshall County) in 1919. The all-time record precipitation amount for this date is 2.52 inches at Minneapolis-St Paul in 1940. State record snowfall for this date is 14.0 inches at Orr (St Louis County) in 1940.

Past Weather Features:

Somewhat rare late season thunderstorms brought rain and hail to southern counties in the state over November 10-11, 1915. Over a month's worth of rain fell, including 1.95 inches at Farmington, 2.00 inches at Fairmont, 2.10 inches at Pipestone, and 2.75 inches at Milan.

November 11-12 of 1940 brought the famous Armistice Day Blizzard to Minnesota with heavy snow and winds of 40-60 mph. Collegeville reported 26.6 inches of snow from this storm, while 24 inches was reported at Meadowlands and 22 inches at Orr. All transportation services (streetcar, railroad, airlines, and bus operations) were shut down for a time. Power outages were widespread as a result of ice, and many hundreds of stranded motorists sought refuge in homes and schools. In all 49 people lost their lives in this storm.

A November heat wave came to southern Minnesota communities on November 11, 1949. Most locations saw afternoon temperatures climb into the 60s F, but several communities reaches the 70s F, including Worthington, Winnebago, Pipestone, Grand Meadow, and Austin.

In 1986 following a significant snow storm over November 8-10, many Minnesota communities reported the coldest ever November 11th with below zero F readings all over the state. Daytime highs nudged above zero F, but not by much. Hallock reported

an afternoon high of 5 degrees F, while Warroad only reached 4 degrees F. Thankfully temperatures rebounded by the 14th into the 20s and 30s F.

Word of the Week: ELOKA

This acronym stands for Exchange for Local Observation and Knowledge of the Arctic, which is a joint international effort to facilitate the collection, preservation, and sharing of local measurements and observations in Arctic regions. It makes use of measurement technologies as well as written and oral histories of the people who reside in the Arctic. You can read more about this effort at...

<http://eloka-arctic.org/about/index.html>

Outlook:

Warm and breezy to start the weekend with increasing clouds by Sunday and a chance for scattered showers. Generally warmer than normal to start the week, then a cool down after Tuesday.

Further Information:

For older versions of the "Minnesota WeatherTalk" newsletter go to

<http://www.climate.umn.edu/weathertalk/>

For access to other information resources go to

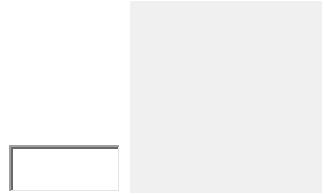
<http://www.climate.umn.edu/Seeley/>

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Minnesota WeatherTalk Newsletter for Friday, November 18, 2011

To: MPR Morning Edition Crew

From: Mark Seeley, University of Minnesota Extension

Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, November 18, 2011

Headlines:

-Snow across the north on November 15

-Coldest Temperatures of the Season

-Winter Outlook holds firm

-Weekly Weather Potpourri

-MPR listener question

-Almanac for November 18th

-Past Weather

-Outlook

Topic: Snow across the north on November 15th

Tuesday, November 15th brought measurable snow across northern Minnesota.

Starting in the west in parts of Polk and Marshall Counties the snow moved east toward Lake Superior later in the day depositing amounts from a half inch to over 3 inches. Some of the snowfall reports included:

0.8 inches at Duluth

1.6 inches at Ely

1.8 inches at Bemidji

2.0 inches at Kettle River, Virginia, and Silver Bay
2.1 inches at International Falls
2.4 inches at Cotton
2.5 inches at Thief River Falls
2.8 inches at Warren
3.0 inches at Roseau and Grand Rapids
3.4 inches at Cook
3.5 inches at Newfolden

In many places the snow did not last long as temperatures warmed into the 30s F. But the snow ushered in the coldest air of the season so far.

Topic: Coldest Temperatures of the Season

Wednesday (Nov 16) and Thursday (Nov 17) of this week brought the coldest temperatures of the season so far to many parts of the state. Many observers reported lows in the teens F. The Twin Cities fell to just 16 degrees F on November 17th, the coldest reading since March 27th. Some western Minnesota observers were even colder, with single digit readings and even below 0 degrees F. Hallock was the coldest spot in the state (and the 48 contiguous states) with -6 degrees F, while Donaldson was -1 degrees F on November 17th. Fosston fell to 0 degrees F. Others who reported single digit lows included: Crookston and Thief River Falls with 1 degrees F; Benson was 3 degrees F; Mahnomen reported 4 degrees F; Morris and Windom fell to 5 degrees F; Park Rapids reported 6 degrees F; and Pipestone and Fergus Falls fell to 7 degrees F.

As a result of the very cold temperatures, the top 3-4 inches of soil began to freeze at University of Minnesota Research and Outreach Centers located at Waseca, Lamberton, Morris, and Crookston. This was true of the soils on the St Paul Campus as well. Drier soils more readily freeze up than wetter ones.

Topic: Winter Outlook holds firm from NOAA CPC

The NOAA Climate Prediction Center released an updated winter outlook on Thursday of this week (Nov 17) covering the months of December through February. The outlook for our western Great Lakes Region remained relatively unchanged from last month. It calls for a higher than normal probability of below normal temperatures (La Nina effect) and for above normal precipitation. Further, the models have been consistent in giving this outlook for our region.

Weekly Weather Potpourri:

The Minnesota State Climatology Office reports that this fall season (September through mid-November) has been one of the driest in history. Many observers have reported 1 inch or less of total rainfall since September 1st, and with the soil freezing up there is less prospect for moisture recharge before the winter season settles in. Depending on the amount of precipitation that falls before the end of November it may be the driest in history for the Twin Cities Metro Area going all the way back to 1871, as well as other areas of the state. You can read more at....

http://climate.umn.edu/doc/journal/drought_2011.htm

NOAA reported this week that October, 2011 was the 8th warmest since 1880 globally, and Arctic sea ice extent was the second smallest since satellite observations began in 1979. You can read more at...

http://www.noaanews.noaa.gov/stories2011/20111115_globalstats.html

NOAA-National Weather Service and Environment Canada report that Arctic high pressure and strong inversions produced some of the coldest temperatures in the northern hemisphere in Alaska and the Northwest Territories this week. Arctic Village and Fairbanks reported -38 degrees F, while Old Crow in northern Canada also reported a low temperature of -38 degrees F.

Researchers at Princeton University report this week in the Journal of Climate that in recent decades day to day variation in weather, especially sunshine and cloudy conditions, along with rainfall variability have seen increases in amplitude. These larger daily swings in weather conditions may be more problematic for certain ecosystems to survive. You can read more about this study at...

<http://www.sciencedaily.com/releases/2011/11/111115175819.htm>

MPR listener question: How often does snowfall occur in the Twin Cities area over the 4-day Thanksgiving Holiday?

Answer: Historically about 60 percent of the time a snowfall occurs on one of the four days. From 1944 to 1958 there was measurable snowfall on every Thanksgiving Holiday in the Twin Cities. The last time it snowed measurably on the Thanksgiving weekend was in 2008.

Almanac for November 18th:

The average MSP high temperature for this date is 41 degrees F (plus or minus 11 degrees F standard deviation), while the average low is 25 degrees F (plus or minus 10 degrees standard deviation).

MSP Local Records for November 18th:

MSP weather records for this date include: highest daily maximum temperature of 68 degrees F in 1904; lowest daily maximum temperature of 13 degrees F in 1874; lowest daily minimum temperature of -4 degrees F in 1891; highest daily minimum temperature of 53 degrees F in 1953; record precipitation of 0.82 inches in 1981; record snowfall is a 7.6 inches in 1957.

Average dew point for November 18th is 26 degrees F, with a maximum of 56 degrees F in 1941 and a minimum of -2 degrees F in 1989.

All-time state records for November 18th:

Scanning the state climatic data base: the all-time high for this date is 75 degrees F at St James (Watonwan County) in 1888 and at Faribault (Rice County) in 1923. The all-time record low for this date is a very cold -19 degrees F at Duluth (St Louis County) in 1940. The all-time record precipitation amount for this date is 3.10 inches at Hinckley (Pine County) in 1996. State record snowfall for this date is 15.0 inches at Spring Valley (Fillmore County) in 1886 and at Crookston (Polk County) in 1998.

Past Weather Features:

This week in 1872 brought a spell of extreme cold to the state. Fort Ripley reported four consecutive nights (Nov 17-20) with below 0 degrees F readings, bottoming out at -14 degrees on the 19th. The daytime high reached only 11 degrees F on the 18th and 19th. Later that month they would record a low of -30 degrees F. Temperatures in St Paul were below 0 degrees F as well, hitting -4 degrees F on the 18th and 19th.

Two years later, November 18, 1874 Fort Ripley reported a low of -13 degrees F and a high of only 8 degrees F, with blowing and drifting snow.

A big snow storm dominated the weather over November 16-18, 1886. Duluth reported 6.5 inches, but Excelsior in the Twin Cities Metro Area, mostly all prairie back then, reported 15.3 inches of snowfall.

November 17-18, 1953 brought almost summer-like weather to many parts of the state. Afternoon temperatures under sunny skies reached 70 degrees F or higher in

over two dozen communities. It was the last gasp of fall, as the final ten days of the month brought consistent snowfall.

A deep low pressure system crossed the state on November 17-18, 1958 bringing winds of 60-70 mph. There was sufficient tree damage and coastal erosion from big waves on Lake Superior that both Cook and Lake Counties were declared for federal disaster assistance. In addition some observers reported near record amounts of rainfall, with 2.32 inches at Spring Grove, 2.60 inches at Mahnomen, 2.63 inches at La Crescent, and 2.67 inches at Caledonia.

November 16-18, 1996 brought an ice storm to southwestern Minnesota and a blizzard to northwestern counties. Power lines were taken down and trees snapped due to the wet of ice in Lincoln, Lyon, Cottonwood, and Pipestone Counties. Thousands of residents were without power for up to 5 days. A 600 ft radio tower near Worthington was toppled and many schools and businesses had to close. In the northwest 8 to 13 inches of snowfall driven by winds up to 45 mph created a blizzard, closing Highway 2 between Grand Forks, ND and Crookston, MN. Moorhead and Crookston reported over 13 inches of snowfall while Georgetown received 10.3 inches.

November 18-19, 1998 saw another heavy snowfall across northern Minnesota. Thief River Falls reported 17 inches, Red Lake Falls and Crookston 16 inches, International Falls 13 inches, and Tower 10 inches. Highway 2 between Grand Forks, ND and Crookston, MN was again closed.

Outlook:

Chance of rain or snow across central, southern, and eastern sections of the state on Saturday, with some snowfall accumulation (2-6 inches) possible in places. Partly cloudy to mostly sunny on Sunday with cooler temperatures. Warming temperatures next week and mainly dry conditions right through Thanksgiving.

Further Information:

For older versions of the "Minnesota WeatherTalk" newsletter go to

<http://www.climate.umn.edu/weathertalk/>

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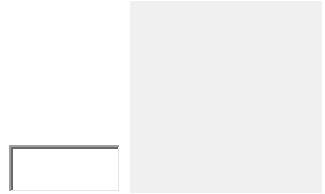
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Minnesota WeatherTalk Newsletter for Friday, November 25, 2011

To: MPR Morning Edition Crew

From: Mark Seeley, University of Minnesota Extension

Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, November 25, 2011

Headlines:

- A record snowfall for some on November 19th
- Cold temperatures short-lived
- Warm Thanksgiving Day
- Weekly Weather Potpourri
- MPR listener question
- Almanac for November 25th
- Past Weather
- WOW
- Outlook

Topic: Snow on November 19th was a record for some

Saturday November 19th brought snowfall to many Minnesota communities. Across central counties common amounts ranged from 3 to 10 inches. Some observing stations reported record snowfall amounts for the date, including: 11.0" at Hinckley; 7.0" at Milaca; 3.8" at St Cloud; 3.6" at Montevideo; and 3.5" at Little Falls. Mora reported 7.8 inches, the 2nd highest amount historically for the date, and many other

observers reported over 8 inches, but they had little or no climate history to compare. For much of the state it was the snowiest November 19th since 1948.

Topic: Cold temperatures last week were short-lived

After seeing above normal temperatures around the state for the first half of November, the temperatures last week were decidedly cooler than normal. Some observers reported their first single digit and below 0 F readings of the fall season. Hallock with -6 degrees F on the 17th and Embarrass with 3 degrees F on the 18th were the coldest in the 48 contiguous states. After a brief spell of cold from the 17th to the 21st temperatures rebounded to above normal levels which will likely persist to then end of the month.

Topic: Warm Thanksgiving Day

November 24th brought the warmest Thanksgiving Day for many Minnesota communities since 1990. Near Redwood Falls the afternoon temperature reached 66 degrees F, just two degrees F shy of the state record for the date (68 F at Wheaton in 1984). But many Minnesota communities reported new record highs yesterday (November 24th) prompting a good deal of outdoor activity for the holiday. Those reporting record highs included: 65 degrees F at Canby; 64 degrees F at Tracy; 61 degrees F at Austin; 60 degrees F at Rochester; 59 degrees F at MSP (tied record); 57 degrees F at Fargo-Moorhead; and 55 degrees F at Detroit Lakes (tied record).

Weekly Weather Potpourri:

The NOAA National Weather Service (NWS) and the American Radio Relay League (AARL) will celebrate Skywarn Recognition Day on December 3, 2011. During the day Skywarn radio operators will visit National Weather Service Forecast Offices and converse with other radio operators around the world. Volunteer Skywarn radio operators help the National Weather Service during storms and severe weather episodes. You can read more about this at....

<http://www.wrh.noaa.gov/mtr/hamradio/>

The USA House of Representative voted recently to kill the bill proposing new NOAA Climate Services. This is unfortunate in that years of planning and internal reallocation of resources had been put into play to make NOAA Climate Services productive and efficient in providing data and climate outlooks to the energy, transportation, agricultural, and insurance sectors of the US economy. This decision makes no sense to those of us serving the public in weather and climate education, and further it signals a distrust of NOAA administration that is unwarranted.

Environment Canada reports snow cover across southern Manitoba and Ontario ranges from 7 to 10 inches this week. Temperatures have been as cold as -16 to -18 degrees F there so far this month and widespread snow cover is expected to persist and increase in depth.

The Joint Typhoon Warning Center was watching the formation of a tropical cyclone off the southern tip of India this week. This storm could bring heavy weekend rains to southern India.

MPR listener question: For the Twin Cities Metro Area when was the coldest and snowiest period between Thanksgiving and Christmas?

Answer: Though last year was record-setting for snowfall between Thanksgiving (Nov 25) and Christmas (Dec 25) with 33.9 inches, the temperature pattern was far from being among the coldest, averaging 17.2 degrees F. By far the coldest and snowiest periods between the Thanksgiving and Christmas holidays was in 1983. Thanksgiving was on November 24. Between that date and Christmas Day (Dec 25) the mean temperature was just 6.9 degrees F with a record setting low of -29 F on December 19th, and total snowfall was 33.5 inches (2nd highest behind last year).

Almanac for November 25th:

The average MSP high temperature for this date is 35 degrees F (plus or minus 10 degrees F standard deviation), while the average low is 22 degrees F (plus or minus 10 degrees standard deviation).

MSP Local Records for November 25th:

MSP weather records for this date include: highest daily maximum temperature of 62 degrees F in 1914; lowest daily maximum temperature of 6 degrees F in 1977; lowest daily minimum temperature of -18 degrees F in 1880; highest daily minimum temperature of 44 degrees F in 1913; record precipitation of 0.97 inches in 1896; record snowfall is a 5.3 inches in 1952.

Average dew point for November 25th is 21 degrees F, with a maximum of 43 degrees F in 1933 and a minimum of -19 degrees F in 1977.

All-time state records for November 25th:

Scanning the state climatic data base: the all-time high for this date is 76 degrees F at Faribault (Rice County) in 1933. The all-time record low for this date is a very cold -36 degrees F at Pokegama Dam (Itasca County) in 1903. The all-time record

precipitation amount for this date is 3.00 inches at Le Sueur in 1896. State record snowfall for this date is 16.7 inches at Island Lake (St Louis County) in 1983.

Past Weather Features:

Wettest Thanksgiving of all time for southern Minnesota was in 1896. Over November 25-26 heavy rains brought 2 to 4 inches to many communities, including: 4.80" at Worthington; 3.36 inches at Farmington; 3.25 inches at Shakopee; 3.18 inches at St Paul; 3.00 inches at Le Sueur; and 2.61 inches at Cambridge.

A Cold Wave Warning was issued on November 25, 1903 as over 24 Minnesota communities reported temperature readings below 0 degrees F. Many northern areas saw temperatures plummet into the -20s to -30s F.

November 24-25, 1914 brought a late fall heat wave of sorts to Minnesota, as 22 communities reported temperatures in the 60s and 70s F. There was a lethal hog cholera outbreak in southern and western counties, and livestock producers took a hit on their bottom line.

Golfers were seen out playing courses on November 25, 1960 as 28 Minnesota cities reported afternoon temperatures in the 60s and 70s F.

With nearly a foot of snow on the ground in much of the Minnesota landscape, November 25, 1977 brought record cold. Nearly every community in the state saw temperatures fall to below 0 F values. Hallock reached a daytime high of only -6 degrees F.

The last week of November, 1993 brought almost continuous daily snowfall to many Minnesota observers. Over November 24-25 the snowfall was especially heavy in western parts of the state, closing some roads there and making Thanksgiving travel very difficult. Detroit Lakes and Fergus Falls reported 17 inches of new snow.

Word of the Week: WOW

This acronym stands for Weather Observations Website, a program launched jointly by the United Kingdom Meteorological Office, Royal Meteorological Society and the UK Education Office last spring. This is a worldwide weather observation program that has already collected over 12.5 million observations from the European and Canadian Arctic to the southernmost regions of New Zealand.

You can read more about WOW at...

<http://www.metoffice.gov.uk/news/releases/archive/2011/wow>

Outlook:

Chance of snow in the north and rain or snow in the south on Saturday, with cooler temperatures. Winds will be strong in many parts of the state as well. Generally dry Sunday through Wednesday with fluctuating temperatures.

Further Information:

For older versions of the "Minnesota WeatherTalk" newsletter go to

<http://www.climate.umn.edu/weathertalk/>

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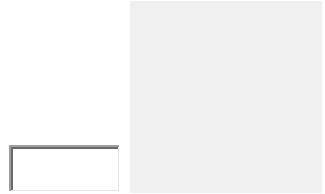
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Minnesota WeatherTalk Newsletter for Friday, December 2, 2011

To: MPR Morning Edition Crew

From: Mark Seeley, University of Minnesota Extension

Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, December 2, 2011

Headlines:

- Preliminary climate summary for November
- Driest autumn of all-time for many
- Weekly Weather Potpourri
- MPR listener question
- Almanac for December 2nd
- Past Weather
- Cobb Method
- Outlook

Topic: Preliminary climate summary for November 2011

Warm and dry are the two appropriate terms for November of 2011. Average monthly temperatures around the state ranged from 3 to 6 degrees F warmer than normal. Extremes for the month were 67 degrees F at Preston and Rushford on the 2nd, and 67 degrees F also at Forest Lake on the 13th, while Hallock reported a state low of -6 degrees F on the 17th. Ice was forming on many area lakes during the last week of the month. Minnesota reported the coldest temperature in the 48 contiguous states four

times during the month, twice this week (1 F at Crane Lake on the 29th, and 2 F at Orr on the 30th).

Precipitation for November was lacking. Statewide it was the 7th driest November in history. The wettest spots in the state were Thief River Falls with 1.50 inches, and Caledonia with 1.39 inches, still well below normal. Many observers reported less than a quarter of an inch, and some like Lakefield, Marshall, and Windom reported less than a tenth of an inch. Snowfall for the month ranged from just a trace to over 12 inches in the far north.

Topic: Driest autumn of all-time for many observers

The Minnesota State Climatology Office has summarized the precipitation deficiencies for September through November, and the numbers are astonishing for many southern counties. From Goodhue and Dodge Counties in the east to Lincoln and Pipestone Counties in the west, much of the Minnesota landscape is in severe drought as a consequence. The Twin Cities has recorded the driest meteorological autumn in history with just 1.35 inches over September 1st to November 30th. You can read more about this at:

http://www.climate.umn.edu/doc/journal/dry_fall_msp_2011.htm

Others (with their 3-month total precipitation noted in parenthesis) who have reported their driest autumn season are: Lakefield (0.84 inches); Lamberton (0.70 inches); Marshall (0.79 inches); Windom (0.89 inches); Worthington (1.01 inches); Fairmont (1.35 inches); New Ulm (1.32 inches); Owatonna (1.27 inches); Sherburn (0.82 inches); Waseca (1.60 inches); and Hutchinson (1.26 inches). Many others reported one of their driest autumns in history as well. You can see more data and read about this at:

http://www.climate.umn.edu/doc/journal/drought_2011.htm

The legacy of this dryness goes all the way back to the end of July. Actually a number of observers in southwestern and south-central Minnesota report the driest August through November period as well. Windom, Marshall, and Lamberton have had less than 1.50 inches of precipitation over that 4-month interval.

As a consequence of this dry period, soil moisture storage going into the winter season is extremely low. The Southwestern Research and Outreach Center at Lamberton reported less than 3 inches of stored soil moisture in the top 5 feet earlier in November, and most of this storage was deeper, between 3 and 5 feet. Similarly, at the Southern Research and Outreach Center in Waseca, the early November soil

moisture measurements were less than 5 inches in the top 5 feet, most of it in deeper layers. Such conditions predispose the Minnesota landscape to be in drought conditions for the start of next year's growing season, unless there is an early and very wet onset to spring.

Weekly Weather Potpourri:

While drought has been making headlines this year from the southern plains (TX, OK) to the western Great Lakes (MN), Kentucky weather observers have been reporting one of the wettest years in history. Hebron, KY has recorded 66.76 inches of rain this year already, shattering the old record of 57.58 inches in 1990. Frankfort has also set a record with 61.33 inches, while Louisville is closing in on a record amount, having already reported over 62 inches for the year (their record is 64.60 inches in 2004).

Damaging Santa Ana winds raked across southern California this week, as winds of 60 mph up to over 100 mph were reported in the region. To the north, Thursday, December 1st brought a barometric pressure reading of 30.75 inches to Portland, OR, their highest December pressure reading in history.

With the end of the North Atlantic Hurricane Season on Wednesday this week (Nov 30) NOAA put together a press release summarizing the 2011 season. Their were 19 named storms of which seven became hurricanes. So it was definitely an active season. You can read more in the summary at....

http://www.noaanews.noaa.gov/stories2011/20111128_endofhurricaneseason_2011.html

A paper published in the November 30th edition of Nature suggests that rapid thaw of permafrost will accelerate climate change as it releases larger amounts of carbon into the atmosphere (much in the form of methane) than previously thought. This is because the amount of organic matter stored in the surface at polar latitudes is relatively higher. More on this study by researchers at the University of Florida and University of Alaska can be found at...

<http://www.sciencedaily.com/releases/2011/11/111130161535.htm>

MPR listener question: Is it true that some of the weather forecasters in the United Kingdom were on strike Wednesday with other public employees?

Answer: Yes, apparently some of the BBC weather forecasters joined the one-day strike, one of the biggest in years. BBC broadcast organizations had to find some substitute forecasters to fill in. They employee meteorologists from the U.K.

Meteorological Office. To the best of my knowledge, National Weather Service forecasters in our country are prohibited from striking, or they lose their jobs.

Almanac for December 2nd:

The average MSP high temperature for this date is 31 degrees F (plus or minus 12 degrees F standard deviation), while the average low is 17 degrees F (plus or minus 14 degrees standard deviation).

MSP Local Records for December 2nd:

MSP weather records for this date include: highest daily maximum temperature of 63 degrees F in 1982; lowest daily maximum temperature of -3 degrees F in 1886; lowest daily minimum temperature of -17 degrees F in 1886; highest daily minimum temperature of 49 degrees F in 1962; record precipitation of 0.30 inches in 1933; record snowfall is a 2.7 inches in 1978.

Average dew point for December 2nd is 19 degrees F, with a maximum of 53 degrees F in 1982 and a minimum of -27 degrees F in 1976.

All-time state records for December 2nd:

Scanning the state climatic data base: the all-time high for this date is 69 degrees F at Mankato (Blue Earth County) and St Peter (Nicollet County) in 1998. The all-time record low for this date is a very cold -47 degrees F at Pokegama Dam (Itasca County) in 1896. The all-time record precipitation amount for this date is 2.51 inches at Caledonia (Houston County) in 1984. State record snowfall for this date is 14.0 inches at Elbow Lake (Grant County) in 1985.

Past Weather Features:

Following a very snowy November, December of 1886 started out extremely cold. The first four days brought below zero F temperatures to all parts of the state. In St Paul the low on December 2nd was -19 degrees F, while the high only reached -2 degrees F. At Morris the daily readings for the same date were -21 degrees F and -10 degrees F, respectively. St Vincent in Kittson County recorded one of its coldest days in history with a low of -31 degrees F and a high of -22 degrees F.

Similarly in 1896 early autumn snowfalls set up a cold start to December. Crookston reported three consecutive days of below zero F readings to start the month. On the 2nd the morning low was -29 degrees F, while the high only warmed to -10 degrees F, with over a foot of snow on the ground.

December 2-3, 1982 brought record warmth to southern and central Minnesota communities. Over a dozen cities reported afternoon temperatures in the 60s F, with south winds and sunny skies.

A blizzard brought heavy snow to Minnesota over December 1-2, 1985. Winds of 40-50 mph caused near zero visibility, closing down many roads in western and southern counties. There were many power outages, and some travelers were stranded overnight, as snow drifts of 4 to 7 feet blocked roads. Some of the heaviest snowfall amounts were: 19 inches at Spring Grove; 18.5 inches at Winona; 18 inches at Waseca; 15.6 inches at Morris; 15 inches at Fairmont; and 14 inches at Faribault.

Another mild December occurred in 1998 with a strong episode of El Nino in the equatorial Pacific influencing the weather pattern over North America. Over 50 communities reported daytime temperatures in the 60s F during the first three days of the month. Chaska hit 70 degrees F on the 1st. With the absence of snow, many area golf courses opened.

Word of the Week: Cobb Method

This is a method to forecast total snowfall amounts from a winter storm using an algorithm that combines storm duration, liquid water available to the storm (call precipitable water), and changing snow ratio during the storm. It was developed in 2005 by Dan Cobb.

Outlook:

The weekend should start out with near seasonal temperatures and snow across the south, central and northeastern areas of the state, perhaps up to a few inches in depth. Continued chance for light snow in areas on Sunday, then dry and cold for Monday and Tuesday. Another chance for snow across the state by next Thursday and Friday.

Further Information:

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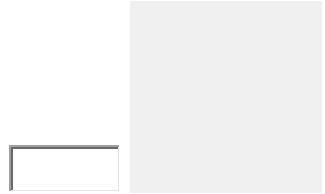
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Minnesota WeatherTalk Newsletter for Friday, December 23, 2011

To: MPR Morning Edition Crew

From: Mark Seeley, University of Minnesota Extension

Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, December 23, 2011

MERRY CHRISTMAS AND HAPPY NEW YEAR TO EVERYONE.....

Headlines:

- Warm December
- Brown Christmas
- Weekly Weather Potpourri
- MPR listener question
- Almanac for December 23rd
- Past Weather
- Superjet
- Outlook

Topic: Warm December Continues

The month of December continues to average from 3 to 6 degrees F warmer than normal. A significantly warmer than normal pattern has prevailed statewide since October. Last weekend after Grand Marais Airport reported the coldest temperature in the 48 contiguous states on Saturday (-11 degrees F) many Minnesota observers then saw record-breaking high temperatures for Sunday, December 18th. Temperatures broke 50 degrees F in many areas, while Montevideo and Madison both topped 60

degrees F. The above normal temperature trend is expected to dominate through the New Year and into the first week of January. This trend may produce a rare occurrence for many southern Minnesota observers, that of not having a single night of below zero F readings during the month of December!

Topic: A brown Christmas

The absence of snow cover at Christmas is somewhat rare in southern Minnesota, but especially unusual for many northern communities. This marks the 8th brown Christmas since 1967 for the Twin Cities area, but for some northern areas it is only the 3rd or 4th brown Christmas over the same period of time. Only northern portions of Koochiching, St Louis, Lake, and Cook Counties are seeing snow cover for this Christmas, and little additional snow is not seen until later in January.

Weekly Weather Potpourri:

A blizzard and heavy snow storm struck parts of Colorado, New Mexico, Kansas, Oklahoma, and northern Texas this week. The storm shut down roads for a while, and caused some power outages. There were scores of traffic accidents as well.

According to NOAA's Storm Prediction Center we will likely conclude 2011 with data showing over 1600 tornado reports across the USA, a very active year. Most of this was due to a record number of storms in the spring. Minnesota reported fewer than average tornadoes, with a very notable absence of such storms during the second half of the year.

The National Weather Service reports this week that the Sierra Nevada range around the Lake Tahoe Basin may see the least amount of December snowfall in over 100 years. Ski resorts have been making snow, but Mother Nature has delivered very little this year to that area. Little additional snowfall is expected until later in January, as high pressure systems have kept storms away for most of the month of December.

MPR listener question: Do you think we will have a record low amount of snowfall this winter around the state? It seem like we are stuck in a pattern where all the storms miss us.

Answer: Indeed, we have had a snow drought so far in many areas. But I don't believe this weather pattern will last through January of 2012. I think we'll see more frequent chances for snowfall during the second half of January.

Almanac for December 23rd:

The average MSP high temperature for this date is 26 degrees F (plus or minus 11 degrees F standard deviation), while the average low is 11 degrees F (plus or minus 13 degrees standard deviation).

MSP Local Records for December 23rd:

MSP weather records for this date include: highest daily maximum temperature of 58 degrees F in 1888; lowest daily maximum temperature of -17 degrees F in 1983; lowest daily minimum temperature of -27 degrees F in 1872; highest daily minimum temperature of 38 degrees F in 1877; record precipitation of 0.53 inches in 1996; record snowfall is a 6.2 inches also in 1996.

Average dew point for December 23rd is 12 degrees F, with a maximum of 36 degrees F in 1982 and a minimum of -37 degrees F in 1983.

All-time state records for December 23rd:

Scanning the state climatic data base: the all-time high for this date is 62 degrees F at Faribault (Rice County) in 1923. The all-time record low for this date is a very cold -48 degrees F at St Vincent (Kittson County) in 1884. The all-time record precipitation amount for this date is 2.10 inches at Cass Lake (Cass County) in 1968. State record snowfall for this date is 13.0 inches at Whitewater (Winona County) in 1871 and at Isabella (Lake County) in 1959.

Past Weather Features:

December of 1872 was one of the coldest in state history, with many overnight readings of -30 degrees F or colder. December 23 was perhaps the coldest ever as the Twin Cities area reported a low of -34 degrees F and a daytime high of -22 degrees F, while further north at Fort Ripley, the morning low was -40 degrees F with an afternoon high of -21 degrees F.

Five years later in 1877 came one of the warmest Decembers in state history. The week leading up to Christmas saw temperatures climb into the 50s F across southern Minnesota and into the 40s up north. The Twin Cities area reported three consecutive days in the 50s F without any snow on the ground.

Again in 1888 the week before Christmas brought mild temperatures. Grand Meadow reported 56 degrees F on December 23rd with no snow cover, while Duluth reported 49 degrees F.

December of 1959 brought heavy snow to northeastern Minnesota. Duluth reported over 16 inches from the 21st to the 23rd, while Isabella reported over 31 inches during the same interval of time. Roads had to be plowed for Christmas travelers that year.

December 1983 was the coldest of the modern era. On the 23rd the Twin Cities reported a low of -25 degrees F with an afternoon high of only -17 degrees F. Windchill values ranged from -40 to -50 degrees F. Sixteen days registered a low temperature that was below zero F and the high on Christmas Day at MSP that year was just 1 degree F.

Word of the Week: Superjet

University of Wisconsin researchers reported at this month's AGU meeting in San Francisco that on occasion the subtropical jetstream merges with the polar jetstream and becomes a superjet which can bring large scale storms across the North American continent and deliver very high volumes of rainfall. You can read more about this study and concept at....

<http://www.sciencedaily.com/releases/2011/12/111205170101.htm>

Outlook:

Mostly sunny with milder than normal temperatures across the state over the Christmas weekend and into next week. Some chance for light snow towards the New Year's weekend.

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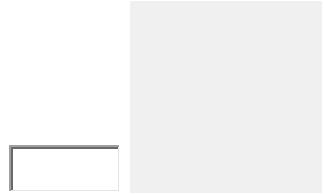
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Minnesota WeatherTalk Newsletter for Friday, December 30, 2011

To: MPR Morning Edition Crew

From: Mark Seeley, University of Minnesota Extension

Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, December 30, 2011

Headlines:

- Preliminary climate summary for December
- 2011 Minnesota significant weather features
- TPT Documentary Tonight (Dec 30)
- Weekly Weather Potpourri
- MPR listener question
- Almanac for December 30th
- Past Weather
- Dzud
- Outlook

Topic: Preliminary climate summary for December

A warm and dry month it was. Most observers are reporting monthly average temperatures that range from 5 to 10 degrees F warmer than normal, placing among the top ten warmest Decembers statewide. Extremes for the month were 59 degrees F at Montevideo on the 18th and -17 degrees F at Babbitt on the 6th. Many communities reported record-setting high temperatures on the 18th and the 26th, with many values in the 50s F. Minnesota reported the coldest temperature in the 48 contiguous states

only twice during the month. December temperatures continued a significant warming trend started in October that marked one of the warmest October, November, and December periods in state history.

Perhaps of greater significance was the lack of precipitation, as December 2011 was among the ten driest historically on a statewide basis as well, and continued the dry trend started last August. Northwestern, North-Central, West-Central, and Southwestern weather observers reported one of the driest Decembers in history, with total amounts of precipitation at some location less than one tenth of an inch. The "wet spot" in the state was Grand Portage which reported 1.70 inches for the month. Only a few locations reported over 5 inches of snowfall during December, including Cloquet with 5.4 inches, Duluth with 5.9 inches, Cook with 6.0 inches, International Falls with 7.3 inches, and Kabetogama with 8.3 inches.

Topic: 2011 Minnesota significant weather features

The Minnesota State Climatology Office has listed the top five weather events for 2011 on our web site:

http://climate.umn.edu/doc/journal/top_five_2011.htm

In addition to the snowy winter, cold January, spring flooding, Minneapolis tornado (May 22), sultry July (record dewpoints and Heat Index), record-setting high wind on September 1st, autumn drought, and brown Christmas, a few other weather features to bookmark the year 2011 include:

There were just 31 tornadoes in Minnesota during 2011 (all reported in May, June, and July), below average, and far below the record 104 of 2010.

The new NOAA climate normals for 1981-2010 were released in July. The new temperature averages are generally warmer and the new precipitation averages are generally wetter for most locations.

Dewpoint of 78 degrees F at Waseca on May 10th was the highest ever measured in the state during May.

August 8, 2011 lightning strikes the Seeley house (first time ever) and does over \$4000 in damages. Fortunately, no injuries. Expertly handled by insurance company.

Temperature extremes for the year were -46 degrees F at International Falls and Babbitt on January 21st, and 103 degrees F at MSP Airport on June 7th.

Precipitation extremes for the year ranged from 37.25 inches at La Crescent to 15.52 inches at Crookston.

And finally, State Climatologist Jim Zandlo retired in October after 25 years of serving the state in that capacity. He was an outstanding public servant and scientist.

Topic: TPT Documentary Tonight (Dec 30)

A TPT documentary on Minnesota's historical weather episodes (blizzards, tornadoes, and spring floods) will air tonight (Dec 30) at 7:00 pm on Almanac, and repeat again at 10:00 pm. Mary Lahammer serves as producer and host showing segments from three historical documentaries about significant weather events.

Weekly Weather Potpourri:

There were many stories in the media this week about the absence of snow cover across much of the USA which normally sees abundant snow by this time each year. Though business associated with winter recreation was suffering in many areas, state, county, and municipal budgets were blessed to have little expenditure associated with snow plowing and snow removal.

A record high temperature was reported on Christmas Day at the Amundsen-Scott South Pole weather station. At 3:50 pm in the afternoon the temperature reached 9.9 degrees F. Can imagine the staff there got out their short-sleeve shirts. You can read more at...

<http://www.wunderground.com/blog/weatherhistorian/comment.html?entrynum=55>

The United Kingdom Met Office and the Open Air Laboratory continue their studies of how we adjust to local weather conditions and therefore have different tolerances when it comes to severe cold. You can read more about this study at...

<http://www.metoffice.gov.uk/news/releases/archive/2011/opal-winter>

Historical patterns in mammal populations have been linked to climate transition periods by researchers at Brown University. The study describes the climate relationships over 65 million years of mammal evolution and migration. You can read more about it at...

<http://www.sciencedaily.com/releases/2011/12/111227093055.htm>

The NOAA Storm Prediction Center in Oklahoma reports that the year 2011 will end with between 1600 and 1700 confirmed tornado reports across the USA. A record number of 875 tornadoes occurred in the month of April alone.

The NOAA National Hurricane Center reported 18 named tropical storms in the North Atlantic Basin, with 7 reaching hurricane status. A relatively quiet year was reported in the Eastern Pacific during 2011 with 11 named tropical storms, though ten reached hurricane status.

The Joint Typhoon Warning Center reported two tropical cyclones in the Indian Ocean this week. Cyclone Thane was bringing winds of 90-100 mph, sea waves up to 22 feet and heavy rains to parts of southern India. Another cyclone was southeast of the island of Diego Garcia and was expected to increase in strength over the weekend, but not be a threat to any islands.

MPR listener question: Now that the end of the year is near, how many months were warmer than normal and how many were colder than normal during 2011? Seems about equal to me.

Answer: On a statewide basis the temperature pattern for 2011 was odd. During the first half of the year 5 of the first 6 months were colder than normal, especially the period January through March. Then the second half of the year, 5 of the final 6 months were significantly warmer than normal, especially October through December, which was record-setting in some areas. This type of temperature signal is very unusual in the climate record.

Almanac for December 30th:

The average MSP high temperature for this date is 25 degrees F (plus or minus 12 degrees F standard deviation), while the average low is 8 degrees F (plus or minus 14 degrees standard deviation).

MSP Local Records for December 30th:

MSP weather records for this date include: highest daily maximum temperature of 51 degrees F in 2004; lowest daily maximum temperature of -6 degrees F in 1976; lowest daily minimum temperature of -20 degrees F in 1973; highest daily minimum temperature of 34 degrees F in 2006; record precipitation of 0.39 inches in 1884; record snowfall is a 4.0 inches in 1906.

Average dew point for December 30th is 10 degrees F, with a maximum of 44 degrees F in 1965 and a minimum of -32 degrees F in 1976.

All-time state records for December 30th:

Scanning the state climatic data base: the all-time high for this date is 59 degrees F at Morris (Stevens County) in 1931 and at Canby (Yellow Medicine County) in 1999. The all-time record low for this date is a very cold -47 degrees F at Warroad (Roseau County) in 1910. The all-time record precipitation amount for this date is 2.00 inches at Pigeon River (Cook County) in 1936. State record snowfall for this date is 14.2 inches at Mankato (Blue Earth County) in 1887.

Past Weather Features:

A Cold Wave dominated parts of Minnesota over December 15-30, 1887. St Vincent in Kittson County reported over 120 consecutive hours below zero degrees F, including readings of -34 F and -44 F. In southern Minnesota Mankato reported over 90 hours below zero degrees F, followed by a 14 inch snowfall.

Another Cold Wave visited the state over December 27-30, 1917 bringing many communities temperature readings of -25 degrees F and colder. Temperatures in the north plummeted to -35 to -45 degrees F.

A strong winter storm passed across the state over December 29-31, 1936. Collegeville reported over 10 inches of snow, Mizpah 13 inches, and 7 inches at Virginia. Areas along the Lake Superior shoreline had rainfall amounts up to 2 inches.

A blizzard dropped 6 to 14 inches of snow across northern Minnesota over December 30-31, 1972 and closed down many roads and highways. A severe ice storm in central counties caused some power outages as well.

December 29-30, 1999 brought remarkable warmth to western and southern Minnesota communities. Many areas reached 50 degrees F or higher, while Montevideo reported a new record of 61 degrees F on the 29th.

Word of the Week: Dzud

Pronounced ZUD, this is a Mongolian term to define a climate feature of the Gobi Desert which occurs periodically and is very devastating to the livestock herds there. This occurs when a summer drought and associated lack of feed is followed by a severe winter (cold and snow), with temperature readings in the -40s and -50s F., and snow too deep to move herds. The most recent dzud episode (2009-2010) cost the lives of over 7 million livestock. You can read more at...

<http://www.sciencedaily.com/releases/2011/12/111229091634.htm>

Outlook:

Very mild temperatures with chances for rain (south), freezing rain (central), and snow (north) over New Years Eve and New Years Day. Winds will be picking up later in the day on Saturday. Cooling down later on Sunday, then drier for Monday, with a chance for snow in the north Tuesday. Temperatures closer to normal will warm later next week. Continued dry next week as well.

Further Information:

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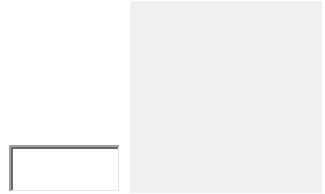
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Minnesota WeatherTalk for Friday, April 6, 2012

To: MPR's Morning Edition

From: Mark Seeley, Univ. of Minnesota, Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk for Friday, April 6, 2012

HEADLINES

- New State Record Temperatures on April 1st and 2nd
- Soil Moisture Update
- Lake ice-out dates
- Weekly Weather potpourri
- MPR listener question
- Almanac for April 6th
- Past weather
- Outlook

Topic: More temperature records to start April

Following a record-setting month of March, April started with some new high temperature records in the southwestern counties of Minnesota. On April 1st (April Fool's Day) Marshall set a new record with 78 degrees F, Pipestone had a new record 81 degrees F, Sioux Falls, SD set a new record with 89 degrees F, and Luverne set a new state record with a high of 90 degrees F. April 2nd brought more records with highs of 80 degrees F at Lakefield, 84 degrees F at Sioux Falls and Worthington, 86 degrees F at Luverne, and a new statewide record of 88 degrees F at Pipestone. And on April 3rd new temperature records were set with 79 degrees F at Redwood Falls, 81 degrees F at Windom and Pipestone, and 82 degrees F at Lakefield. Temperatures

in southern and western portions of the state are averaging 13-18 degrees F warmer than normal for the month of April so far.

April 2nd also brought a round of thunderstorms to the state, some bringing large hail (up to 3/4 inch diameter). A few observers reported 0.30 to 0.50 inches of rainfall, but it was quite spotty.

Topic: Soil moisture still short, but improving in some places

University of Minnesota Research and Outreach Centers monitor soil moisture conditions for Minnesota's major crops. Last fall's (2011) measurements made it obvious that soil moisture storage was well below normal going into the winter season. For many areas over winter and early spring precipitation has been inadequate to help fully restore soil moisture to near normal levels for the spring. At Lamberton the final measurements from last fall showed 2.95 inches of stored soil moisture in the top 5 feet of the soil profile. Measurements made earlier this week showed that the profile moisture content had only "improved" to 3.09 inches of stored moisture, still roughly 2.5 inches less than average for this time of year. Further much of this moisture lies well below 3 feet and is out of the reach of crop rooting systems early in the growing season. So additional spring rains in April and early May are needed to recharge the upper layers of the soil for good germination and early development of corn and soybean crops.

For some areas, over winter and early spring recharge has been helpful. For example, at Waseca the final soil moisture measurements from last fall showed 4.67 inches of available moisture in the top 5 feet of the soil profile. The measurements made earlier this week in the same soil showed 7.37 inches of available stored soil moisture, an increase of 2.70 inches. This recharge came primarily from the Leap Day storm (Feb 29) which dropped 1.96 inches of rain, and the mid-March rains (Mar 20-23) which infiltrated the soil as well. Though this measurement is still below normal for stored soil moisture this time of year, this level of moisture is adequate for starting the planting season with optimism in the Waseca area.

Periodic seasonal updates on soil moisture values around the state will be available under the Agricultural Climate Information section of our web site:

<http://www.climate.umn.edu/doc/agwx.htm>

Topic: Notes on early ice-out dates for Minnesota lakes

We have spoken in recent years about the obvious trend in earlier ice-out dates on Minnesota lakes. This year a number of lakes with lengthy observation records saw

their earliest ice-out in history. The list below is compiled by Pete Boulay of the MN-State Climatology Office and available online at http://climate.umn.edu/doc/journal/ice_out_recap_2012.htm

Lake Name County New Record Old Record Period of Record

White Bear Lake Ramsey/Wash March 19, 2012 March 21, 2000 85 years
Minnewaska Pope March 21, 2012 March 23, 2000 107 years
Green Kandiohi March 20, 2012 March 22, 1987 83 years
Mille Lacs Mille Lacs March 26, 2012 April 2, 2000 56 years
Big Sandy Aitkin March 26, 2012 March 31, 2000 59 years
Bemidji Beltrami April 2, 2012 April 6, 2010 76 years
Leech St. Louis April 2, 2012 April 6, 2010 77 years
Vermilion St. Louis April 2, 2012 April 6, 2010 93 years

Perhaps the bill in the MN-Legislature to advance the date of the Fishing Opener to May 5th this year will provoke a movement to make a permanent change to an earlier date so there will be no more conflicts with Mother's Day weekend.

Weekly Weather Potpourri:

Wednesday afternoon and evening brought 13 tornadoes to the Dallas-Fort Worth area of Texas, some that were large and destructive. Hundreds of homes and buildings were damaged, but no fatalities were reported thanks in part to timely warnings from the National Weather Service. Hail damaged more than 100 aircraft at the DFW Airport. It was the first outbreak of tornadoes this month, following 223 reports of tornadoes during March nationwide.

A recent paper by the U.K. Met Office scientists which appears in the journal Nature finds a possible link between industrial air pollution, volcanic activity, and the changes in the temperature patterns of the North Atlantic Ocean. Given the importance of North Atlantic sea surface temperatures to precipitation patterns across Africa and South America it is critical to understand how human caused pollution may affect ocean temperature patterns in the future. You can read more about this study at...

<http://www.metoffice.gov.uk/news/releases/archive/2011/aerosols-and-the-atlantic>

For golf fans following the Master's Golf Tournament this week from August, GA, the Southeast Regional Climate Center has created a complete climatology for this event covering the period from 1934 to the present. You can find all the weather records you want. For example, there have been 15 years when no rainfall occurred during the

tournament. Conversely it rained 2.67 inches on Saturday, April 7, 1973. More information can be found at the web site....

<http://www.sercc.com/MastersClimo.pdf>

Despite the prevailing warm temperatures this season across the state of Minnesota, Silver Bay reported one of the coldest mornings in the nation on Friday, April 6th with just 16 degrees F.

MPR listener question: I know that forecasters have warned us that possible freezing temperatures will occur in the Twin Cities yet in April, but what about snowfall. How often does it snow in April or May in the Twin Cities area?

Answer: Indeed, frost may be a possibility on Monday through Wednesday mornings, and yet again even later in the month. At least a trace of snowfall has been observed during the months of April and May in the Twin Cities 95 percent of all years since 1885. This is a remarkably high percent. The most recent years without any snow in April and May were 2010 and 2006.

Twin Cities Almanac for April 6th:

The average MSP high temperature for this date is 50 degrees F (plus or minus 12 degrees F standard deviation), while the average low is 32 degrees F (plus or minus 8 degrees F standard deviation).

MSP Local Records for April 6th:

MSP weather records for this date include: highest daily maximum temperature of 86 degrees F in 1991; lowest daily maximum temperature of 26 degrees F in 1939; lowest daily minimum temperature of 10 F in 1979; highest daily minimum temperature of 54 F in 1921; record precipitation of 2.58 inches in 2006; and record snowfall of 6.0 inches in 1928. Snow depth was 8 inches on this date in 1975.

Average dew point for April 6th is 28 degrees F, with a maximum of 59 degrees F in 1921 and a minimum of -3 degrees F in 1979.

All-time state records for April 6th:

The state record high temperature for this date is 90 degrees F at Madison (Lac Qui Parle County) and Winona (Winona County) in 1991; the state record low temperature for this date is -22 degrees F at Karlstad (Kittson County) in 1979 and at Tower (St Louis County) in 1982. State record precipitation for this date is 2.67 inches at

Dawson (Lac Qui Parle County) in 1997; and state record snowfall for this date is 18.0 inches at Fosston (Polk County) in 1947.

Past Weather Features:

A heavy fall of snow occurred in the southern part of the state back on April 6, 1928 with many places receiving 6 or more inches. Downtown St Paul reported 7 inches, Zumbrota 8 inches, Maple Plain 9.5 inches, and Fairmont 11.4 inches, still a record snowfall for the date there.

Another heavy snow storm occurred on April 6, 1947 bringing several inches of snow, and record setting snow to some northern Minnesota communities. Moorhead and Babbitt reported 9 inches, 10 inches fell at Blackduck, 14 inches at Red Lake, and 18 inches of snow was reported at Fosston. It was a Sunday and some churches did not hold services.

April 6, 1979 was perhaps the coldest in history across the state as most northern Minnesota communities reported below 0 F readings. For some observers the daytime temperature never rose out of the teens F that day. It was -5 degrees F as far south as Maple Plain.

A remarkable two-day heat wave occurred across Minnesota over April 5-6, 1991. Many observers reported daytime temperatures in the 80s F on consecutive days. Farmers were anxious to get field work done, but thunderstorms prevailed the rest of the month making soil conditions too wet.

An most unwelcome blizzard occurred April 5-6, 1997 across the Red River Valley when most communities were in the middle of a flood fight due to a rapidly rising Red River. Many areas reported 5 to 7 inches of snowfall with near zero visibility at times. A mixture of rain, sleet, and freezing rain fell elsewhere. Ice accumulated on power poles and lines knocking out power to many communities. Interstate 94 was closed for a time between Moorhead and Fergus Falls.

April 6-7, 2006 brought heavy thunderstorms to eastern sections of the state. The Twin Cities reported their heaviest ever April rainfall with 2.58 inches. Albert Lea reported 2.57 inches and Fairmont received 3.35 inches. Many basements were flooded in Martin County, and elsewhere a number of roads were closed due to high water.

Outlook:

Chance of showers over the weekend, possibly a few snow showers in the north. Chances for frost Monday, Tuesday, and Wednesday mornings around the state. Generally dry next week with daytime temperatures that are near seasonal normals. Some warming towards the end of the week.

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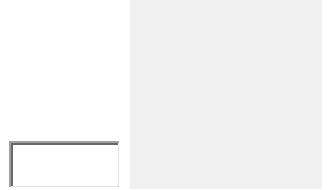
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Minnesota WeatherTalk Newsletter for Friday, April 20, 2012

To: MPR's Morning Edition

From: Mark Seeley, Univ. of Minnesota, Dept of Soil, Water, and Climate

Subject: Minnesota WeatherTalk Newsletter for Friday, April 20, 2012

HEADLINES

- Wind as art
- Moisture records set
- Weekly Weather potpourri
- MPR listener question
- Almanac for April 20th
- Past weather
- Word of the Week
- Outlook

Topic: Wind as art

Members of the American Association of State Climatologists shared this web site recently. It depicts near real-time wind patterns across the continental USA, showing the animated streamlines (trajectory and velocity) in a manner that is quite artistic. You need the latest Chrome browser to view it. The data come from NOAA's National Digital Forecast Database. Give it a try....

<http://hint.fm/wind/>

Topic: Dewpoint records set, along with precipitation and snowfall records, April 15-16

Just ahead of the rain and thunderstorms over April 15th strong southeast winds brought in warm, moist air to southern Minnesota, setting new high dewpoint records for the date. MSP tied a record from 1976 with a late afternoon dewpoint of 61 degrees F, while preliminary data indicate a new dewpoint record of 63 degrees F at Fairmont and Mankato. In addition a new dewpoint record of 64 degrees F was set at New Ulm. These values occurred just ahead of the severe thunderstorms, hail, funnel clouds, tornadoes, and strong winds which were reported last Sunday.

Many observers reported heavy precipitation on April 15th and 16th, some record-setting. MSP reported a new record with 1.19 inches, while St Cloud reported a record 1.51 inches. Others reporting new daily precipitation records included: 2.22 inches at Browns Valley; 2.11 inches at Wheaton; 2.10 inches at Pelican Rapids; 2.02 inches at Duluth; 1.97 inches at Rothsay; 1.87 inches at Babbitt; 1.85 inches at Tower; 1.71 inches at Moose Lake; 1.71 inches at Pipestone; 1.59 inches at Park Rapids; 1.53 inches at Aitkin; 1.51 inches at Grand Rapids; 1.46 inches at Spring Grove; 1.36 inches at Hibbing; and 1.14 inches at Morris.

In the far north, strong winds (50-60 mph) and significant amounts of snow were reported, with many roads closed, power outages, and numerous accidents. Several observers reported new daily record snowfall amounts for April 16th, including: Babbitt with 5 inches; Tower with 6.3 inches; Cook, Hibbing, and Bigfork with 8.0 inches; Kabetogama had a record 9.4 inches; and Orr and Chisholm received a whooping record 11 inches.

Weekly Weather Potpourri:

NOAA-Climate Prediction Center released new seasonal outlooks on Thursday this week. They show that for the May, June, and July period Minnesota has equal chances of being warmer or colder than normal, and equal chances of being wetter or drier than normal. The drought-stricken areas of southern and central Minnesota are expected to see some slight improvement through July 31st. You can read more at...

<http://www.cpc.ncep.noaa.gov/products/Drought/>

With Earth Day coming up this weekend (April 22) and many celebrations and events planned for next week, NOAA features a number of ways to acknowledge environmental stewardship and to get involved. You can find a number of features and programs at their web site. They show a map which depicts up to 75 Earth Day events going on across the nation. You can find this information at:

<http://www.noaa.gov/earthday/index.html>

Following a record-setting April last year (2011) when there were 758 tornado reports across the nation, the NOAA-Storm Prediction Center shows 159 tornado reports so far this month. The vast majority occurred on April 14th with 146 reports filed. So the rest of the month has been rather quiet so far. Hopefully it will remain that way. Nevertheless if you want to update yourself on severe weather safety please go to the NOAA-National Weather Service Chanhassen web site and view the materials there.

<http://www.crh.noaa.gov/mpx/?n=swaw>

The United Kingdom Meteorological Office has chosen Shelterbox as its designated charity for the past three years. They have supported Shelterbox both with a financial commitment and a service commitment, providing forecasts specific to community recovery efforts following natural disasters around the world. The UK Met Office three-year commitment will end this summer, but Shelterbox certainly is a charity worth supporting. They deliver the essentials a family needs to survive in the immediate aftermath of a disaster. Each large, green ShelterBox delivered to a disaster site is tailored to primary needs of families, typically containing a disaster relief tent for an extended family, blankets, water storage and filtration equipment, cooking utensils, a stove, a basic tool kit, a children's activity pack and other vital items. You can learn more about Shelterbox at their web site:

<http://www.shelterbox.org/about.php>

A recent study from the University of Zurich documents that Himalayan glaciers are not shrinking as rapidly as predicted by the IPCC. However, they do continue to shrink and produce more glacial lakes and create greater variability in the volume of some watersheds that are relied upon by various cultures that occupy low-lying regions. You can read more about this study at.....

<http://www.sciencedaily.com/releases/2012/04/120419143119.htm>

MPR listener question: With the significant snowfall amounts up north earlier this week, did any observers reported above normal amounts for the 2011-1012 snow season in Minnesota? It seems like everybody ended up short of average.

Answer: Only a few observers have reported modestly above average total snowfall for the 2011-2012 season. These observers are all in the northeastern part of the state and include: 86.8 inches at Isabella (Lake County); 75.3 inches at Kabetogama (St Louis County); 65.3 inches at Orr (St Louis County); and 64.3 inches at Two Harbors (Lake County).

Twin Cities Almanac for April 20th:

The average MSP high temperature for this date is 55 degrees F (plus or minus 11 degrees F standard deviation), while the average low is 35 degrees F (plus or minus 9 degrees F standard deviation).

MSP Local Records for April 20th:

MSP weather records for this date include: highest daily maximum temperature of 84 degrees F in 2006; lowest daily maximum temperature of 33 degrees F in 1893 and 1928; lowest daily minimum temperature of 2 F in 1962; highest daily minimum temperature of 61 F in 1941; record precipitation of 0.94 inches in 1991; and record snowfall of 8.5 inches in 1928. Snow depth was 5 inches on this date in 1962.

Average dew point for April 20th is 31 degrees F, with a maximum of 64 degrees F in 1941 and a minimum of -2 degrees F in 1950.

All-time state records for April 20th:

The state record high temperature for this date is 96 degrees F at Georgetown (Clay County) in 1980; the state record low temperature for this date is 0 degrees F at Cloquet (Carlton County) in 1928. State record precipitation for this date is 3.08 inches at Collegeville (Stearns County) in 1893; and state record snowfall for this date is 18.0 inches at Fort Ripley (Crow Wing County) in 1893.

Past Weather Features:

A strong spring storm hit the state on April 20, 1893 delivering record-setting precipitation and snowfall amounts to many cities. Some of the record precipitation/snowfall amounts included: 1.50 inches of precipitation and 16 inches of snowfall at Cambridge; 1.40 inches of precipitation and 14 inches of snowfall at Rochester; 1.63 inches of precipitation and 14 inches of snowfall in downtown St Paul; and 1.80 inches of precipitation and 18 inches of snowfall at Fort Ripley. Many observers reported 8 to 12 inches of snowfall from this storm, one of the heaviest ever in the month of April.

Following a fresh snowfall of several inches a record-setting Cold Wave prevailed on April 20, 1928. Many record-setting low temperatures were observed, including 0 degrees F at Cloquet; 2 degrees F at Grand Rapids; 5 degrees F at Lake Winnie; 6 degrees F at Leech Lake and Bemidji; and it was 19 degrees F as far south as New Ulm. Temperatures remained below freezing all day at a number of locations.

April 19-21, 1970 brought heavy snowfall to many parts of Minnesota, especially central and northern cities. Strong winds up to 60 mph combined with the heavy snow to bring down some power lines and telephone lines in northern Minnesota counties causing numerous outages. Some communities reported a foot or more of new snowfall, topped by 17 inches at Big Falls and 21 inches at Kelliher.

The warmest April Heat Wave ever started on the 20th in 1980 and lasted 3 days. Many western Minnesota observers reached the 90 F mark, and some even reached 100 degrees F, the earliest date for such a mark. Those reporting 100 degrees F included: Ada, Campbell, Georgetown, Montevideo, Moorhead, Hawley (101 F a state record for the month of April), Browns Valley, Argyle, and Hallock. Thankfully a strong cold front collapsed temperatures into the 60s F by the 23rd.

Starting about 8:15 pm on April 20, 1985 an F-3 tornado (winds 158-206 mph) made its way 8 miles across the landscape in Pipestone and Murray Counties, near Lake Wilson. It damage or destroyed 43 farms and injured two people. Several livestock were reportedly killed as well.

Word of the Week: "Storm Scammers"

This term is used to refer to contractors who rush into communities following natural disasters and approach those home and business owners who have suffered loss with high pressure sales tactics to get them to sign contracts for repair and restoration services, even before insurance adjusters have had time to visit. Some states have taken action against such practices. Provisions are allowed in many states for home and business owners to cancel contracts that were signed without proper disclosure or licensing. You can read more about this at....

<http://www.usatoday.com/weather/index>

Outlook:

Most cloudy with chances for rain early in the weekend, some chance for showers in the east continuing on Sunday, brighter and warmer on elsewhere. Even more sun and warmer on Monday. Warming trend continues into next week with some temperatures reaching the 70s F. Chances for showers return on Wednesday and Thursday.

Further Information:

For older versions of the "Minnesota WeatherTalk" newsletter go to

<http://www.climate.umn.edu/weathertalk/>

For access to other information resources go to

<http://www.climate.umn.edu/Seeley/>

NOTE: News releases were current as of the date of issue. If you have a question on older releases, use the news release search (upper left-hand column of the [News main page](#)) or the main Extension search (upper right of this page) to locate more recent information.

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