



NWS Resources For School Districts

January 23rd, 2017

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Outline

- Watches/Warnings/Advisories
 - Example of Impact-Based
- Products/Resources Available To You
 - Information you can access on our website
 - iNWS interactive NWS
 - NWS Chat
 - MASA Weather Page
- Decision Support Services
 - Webinars
 - Email Blasts

Products And Services Available To Decision-Makers

- Call Us! (952-361-6671 or 1-800-692-2110)
 - We answer the phone 24 hours a day.
 Remember, we are a 24/7/365 operation!
- Social Media- Follow us on <u>Facebook/Twitter</u>
- Utilize <u>NWSChat</u>
- •Email us nws.twincities@noaa.gov

Products And Services Available To Decision-Makers

- Warnings/Advisories/Watches
 - How are they defined?
 - Pros/Cons
 - Statistics

Watch, Warning, Advisory

•WATCH: Weather having a **significant impact** on society is **possible** but details are uncertain.



Watch, Warning, Advisory

•WARNING: Weather having a **significant** impact on society is **imminent or highly likely.** Dangerous conditions expected.



Watch, Warning, Advisory

•ADVISORY: Weather having a moderate impact on society is imminent or highly likely. Hazardous conditions expected, but should not be dangerous if precautions are taken.



NWS Warning Criteria (discretion)

- •Ice Storm: 1/4" ice or more
- •Wind Chill: -35 F
- •High Wind: 40 mph sustained, 58 mph gusts
- •Heat: 100 heat index (105 outstate)
- •Flood: river reaches flood stage or long-term areal
- Flash Flood: life threatening
- Severe Tstm: 58 mph and/or 1" hail
- Tornado: radar or spotter

NWS Products

- Winter Storm Warning
 - Snow of 6" or more in 12 hours
 - Or Snow of 8" or more in 24 hours
 - Or ½" or more of sleet
 - Or a combination of heavy snow, sleet, significant wind, or freezing rain

NWS Products

- Winter Storm Watch/Blizzard Watch
- Watches are issued once the forecaster reaches 50% confidence in an event reaching the criteria.
- We continue to move to forecaster discretion based on impacts
- •The process is evolving... "NWS will evolve from static definitions toward a services model"

Pros Of Watch Products

Pros

- Provides you with a "heads up" 36+ hours ahead of time
- Well communicated
- Area and time defined

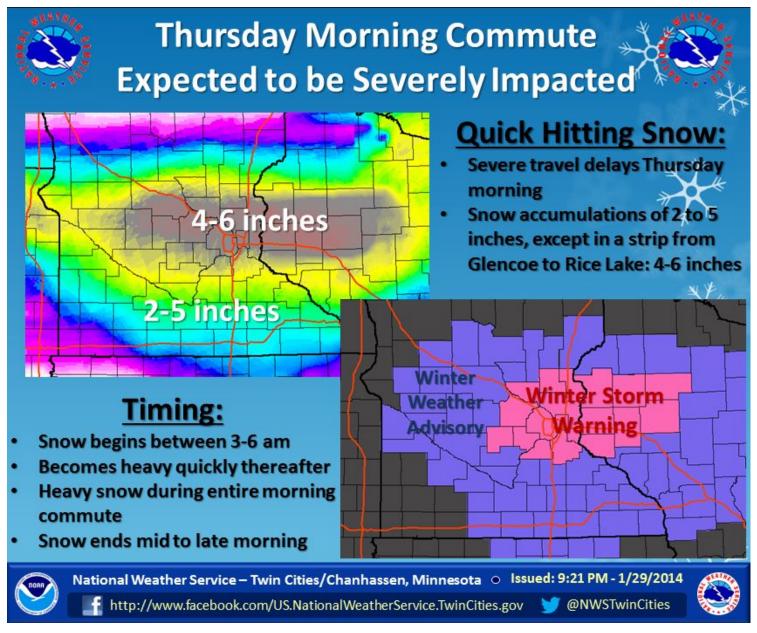
Cons Of Watch Products

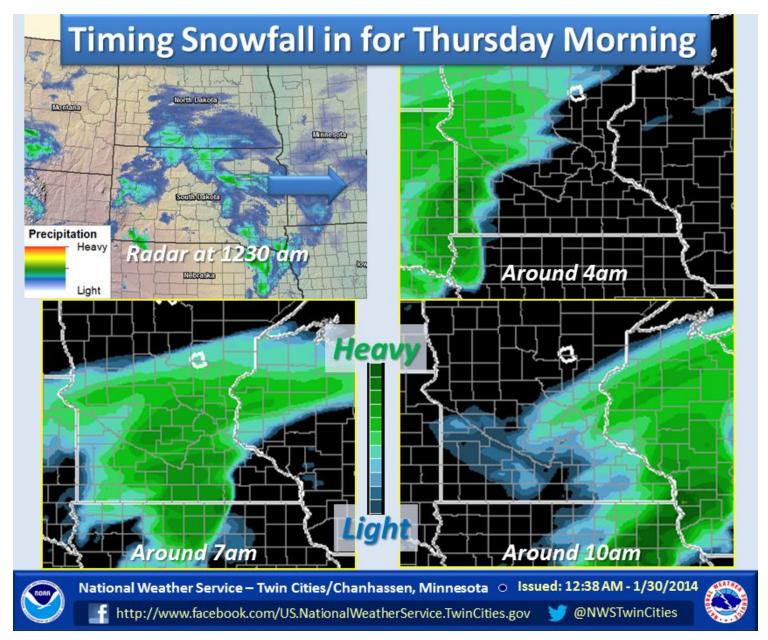
Cons

- Can be misinterpreted
- Watches = 50% of criteria being reached. What does this mean to the user?
- Many expect a Watch to become a Warning. This is a misinterpretation of the product

January 30th, 2014

- Heavy snow occurred across the metro from 6AM-9AM on a Thursday morning.
- •Amounts were generally under 6", but a Winter Storm Warning was issued the night before due to expected societal impacts from the timing and intensity of the snow.





AFD Update

AREA FORECAST DISCUSSION...UPDATED
NATIONAL WEATHER SERVICE TWIN CITIES/CHANHASSEN MN
836 PM CST WED JAN 29 2014

.UPDATE... ISSUED AT 836 PM CST WED JAN 29 2014

SIGNIFICANT UPDATES HAVE BEEN MADE TO THE FORECAST LATE TONIGHT AND EARLY THURSDAY. SHORT TERM MODELS AND THE 00Z NAM HAVE COME CONSIDERABLY FARTHER NORTH AND HAVE BECOME MORE INTENSE WITH THE BAND OF SNOW. IT WILL BE A QUICK HITTING SYSTEM...BUT IT WILL BE ACCOMPANIED BY VERY HEAVY SNOW DURING THE MORNING RUSH WHICH WILL LIKELY BRING SEVERE IMPACTS.

THE LOW CURRENTLY IS LOCATED OVER SOUTHWESTERN SD AND WILL TRACK ALONG THE SD/NE BORDER INTO SOUTHEASTERN MN BY MIDDAY THURSDAY. THE SNOW IS CURRENTLY FALLING IN A RELATIVELY DATA SPARSE AREA OF SOUTHEASTERN MT...BUT MILES CITY HAS REPORTED 1/2-3/4 MILE SNOW FOR THE PAST FEW HOURS. AS THIS DISTURBANCE ROTATES EASTWARD...THE 700 MB TROUGH WILL DEEPEN OVER MN AT 12Z AND CONTINUE TO DO SO OVER WI BY 18Z. DEEP OMEGA WITHIN THE DGZ AND A FAIRLY HIGH AMOUNT OF MOISTURE FOR LATE JANUARY WITH PW VALUES OF AROUND 0.4 INCHES /ABOVE THE 75TH PERCENTTLE / ... SHOULD WORK TO PRODUCE VERY INTENSE SNOW RATES AT TIMES. THESE SNOW RATES COULD REACH 1-2 INCHES PER HOUR DURING THE HEIGHT OF THE EVENT...SURE TO WREAK HAVOC WITH THE MORNING COMMUTE. THE HOPWRF...HRRR...AND RAP ALL GENERALLY AGREE WITH THE LOCATION/AXIS OF HEAVY SNOW STRETCHING FROM GLENCOE TO THE TWIN CITIES AND RICE LAKE. NEW OOZ NAM HAS COME INTO LINE WITH THIS IDEA AS WELL SO CONFIDENCE HAS INCREASED ENOUGH TO POST A WARNING ALONG THIS AXIS AND AN ADVISORY ELSEWHERE. FUTURE ADJUSTMENTS MAY BE NECESSARY AS THE REST OF THE OOZ MODEL SUITE IS GENERATED.

NWS Products

- Winter Weather Advisory
- •Snow of 3-6"
- Blowing Snow causing significant visibility restrictions
- •Sleet of less than ½"
- Exceptions to these guidelines exist based on forecaster judgment
 - Impacts

NWS Products

- Blizzard Warning
 - 35+ mph (sustained or frequent gusts)
 - □Visibility frequently < ¼ mile</p>
 - Considerable falling OR blowing snow
- •What's missing?
 - Snowfall amount

Pros Of Warning Products

Pros

- Clearly defines an area and time when impacts will occur
- Clearly defines the hazard
- Communication of these products
 Well advertised- easy for you to get this information
- Consistency

Cons Of Warning Products

Cons

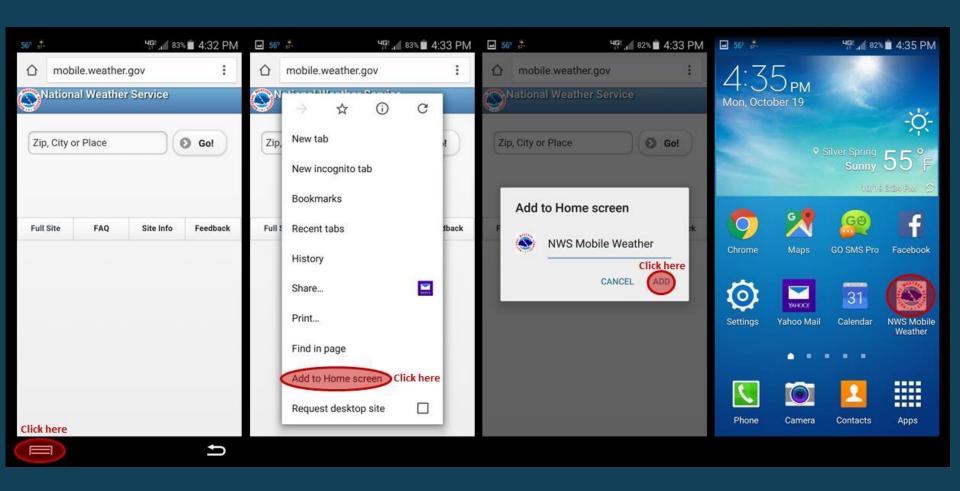
- County based- we are limited to county borders
- Difficult to get away from issuing based on static definitions
- Often lacks a description of forecaster confidence
- Can be difficult to interpret large blocks of text

Products And Services Available To You

- Additional Useful Resources
 - •Mobile Devices
 - Hourly Weather Graph
 - AFD- Area Forecast Discussion
 - Graphical Forecasts
 - EHWO- Enhanced Hazardous Weather
 - Outlook
 - Snowfall Probabilities
 - •iNWS- interactive NWS
 - NWS Chat
 - MASA Weather Page

Mobile Devices - NWS Info

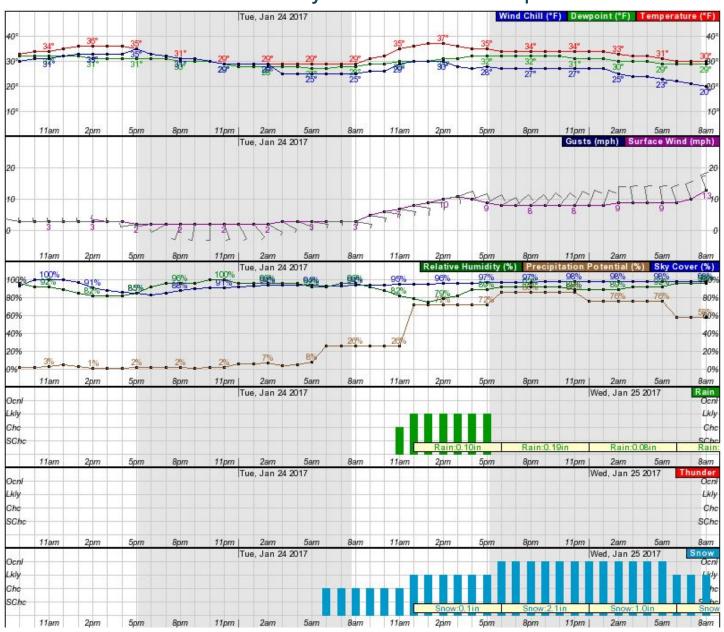
mobile.weather.gov



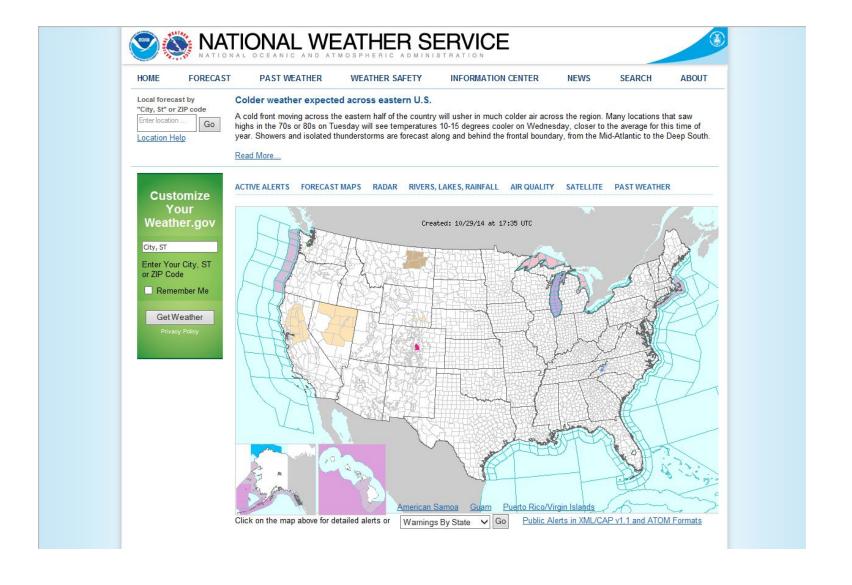
Useful Resources

- The Hourly Weather Graph/Table
- An interactive graph showing hourly details for weather elements for any location
- A great tool in aiding decision-making
- •When will the snow be the heaviest?
- •What exact timeframe will windchills be the coldest?

The Hourly Weather Graph

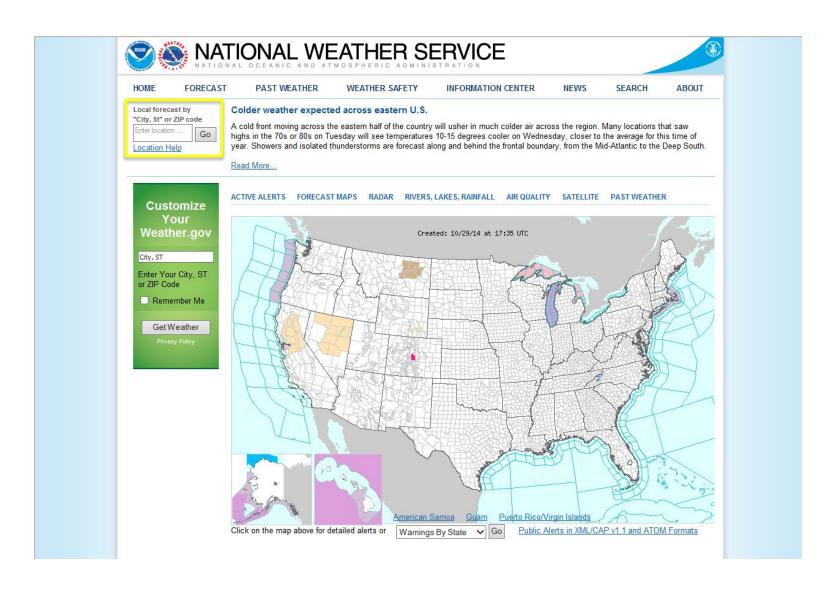


How To Get To The Hourly Weather Graph 1) Go to our national website: weather.gov

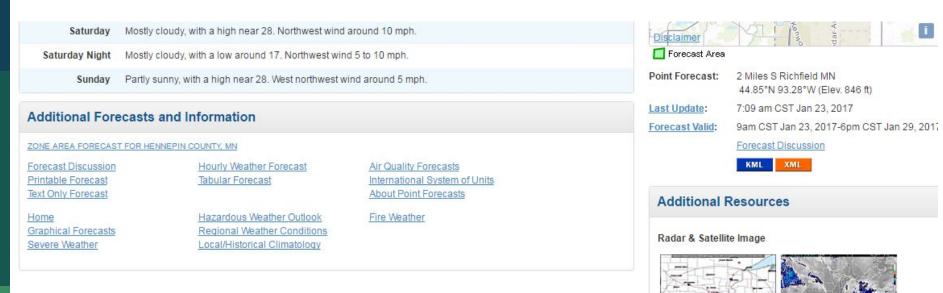


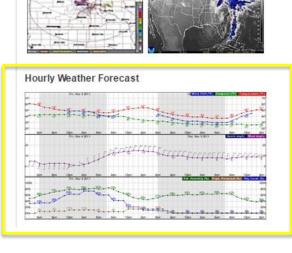
How To Get To The Hourly Weather Graph

2) Submit you local city or zip code in the box in the upper left hand corner



How To Get To The Hourly Weather Graph 3) Your local forecast comes up, find the "hourly weather graph" on the right hand side





A Table Instead Of a Graph?

Date	01/23															01/24								
Hour (CST)	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	00	01	02	03	04	05	06	07	08
Temperature (°F)	33	34	34	35	36	36	36	36	35	33	32	31	31	30	29	29	29	29	29	29	29	29	29	29
Dewpoint (°F)	32	32	32	32	32	31	31	31	31	31	31	30	30	30	29	28	28	28	28	28	27	27	28	28
Wind Chill (°F)	30	31	31	32	33	33	33	33	35	33	32	31	31	30	29	29	29	29	25	25	25	25	25	25
Surface Wind (mph)	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3
Wind Dir	W	W	W	W	W	W	W	W	W	W	WSW	SSW	S	S	SSE	SSE	SE	ESE	ESE	ESE	E	E	E	E
Gust																								
Sky Cover (%)	93	100	100	100	97	91	88	86	85	83	85	88	90	91	91	92	93	94	94	94	94	93	93	94
Precipitation Potential (%)	2	2	3	5	3	1	1	1	2	2	2	2	1	2	2	6	6	7	4	5	8	26	26	26
Relative Humidity (%)	96	92	92	89	85	82	82	82	85	92	96	96	96	100	100	96	96	96	96	96	92	92	96	96
Rain	57.3	=	-	50	-	55	-	==	-	-			- T- 1	-	=		-	-	=	77	-	-	-	-
Thunder	-	-	-		-					-			-	-	-					-	-			
Snow	_		_	22		22		22	_				_		2		_		22	22		Chc	Chc	Chc
Freezing Rain	120		_	15	_		_		_	_	-	_	-3	_		_	-5	-		12	-	_	_	-
Sleet	-		-	2	-		-		-	-			-	_		-	-	-		2	-	-	-	

Area Forecast Discussion

- •This product explains the thinking behind the forecast and is generated by the forecaster after they've completed their forecast
- The AFD is updated at least 2x per day
- Updated ~4 AM and ~4PM

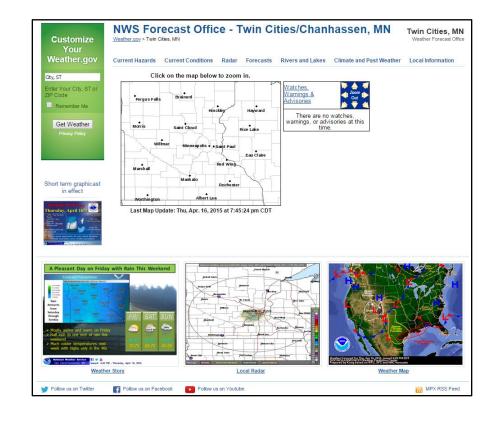
An AFD Example

.SHORT TERM...(THIS EVENING THROUGH THURSDAY)
ISSUED AT 249 PM CST WED JAN 29 2014

ACCUMULATING SNOW EXPECTED TO BEGIN OVERNIGHT ACROSS THE SOUTHWESTERN MINNESOTA AND MOVE WEST TO EAST ACROSS THE REMAINDER OF SOUTHERN MINNESOTA AND WESTERN WISCONSIN DURING THE MORNING THE MORNING COMMUTE WILL BE HEAVILY IMPACTED...AS THE HEAVIEST SNOW LOOKS TO REACH THE METRO FROM ROUGHLY 6AM-9AM. WINTER WEATHER ADVISORY WAS POSTED AFTER COLLABORATION WITH ARX AND DMX...WITH THE HEAVIEST SNOW AMOUNTS EXPECTED IN IN THE ARX CWA. STILL...ALBERT LEA THROUGH RED WIND...AND OVER TO EAU CLAIRE ARE EXPECTED TO SEE ROUGHLY 3-4 INCHES OF SNOW...WHICH WILL BE HEAVY AT TIMES DURING THE PEAK TRAVEL TIME THURSDAY MORNING. OF THE ECMWF INCREASED QPF TO THE NORTH AND BETTER MATCHES THE NCEP PREVIOUS FORECAST LOOKED VERY GOOD...SO ONLY MINOR TWEAKS WERE MADE...MAINLY TO THE TIMING WHICH DELAYED THE ONSET OF THE SNOW BY ABOUT TWO HOURS. UPPER LEVEL DYNAMICS LOOK GOOD TOMORROW MORNING ACROSS THE AREA...WITH THE BEST UPPER LEVEL FORCING MOVING ACROSS SOUTHERN MN OVERNIGHT AND INCREASING OVER SOUTHEASTERN MN INTO THE GOING FORECAST CALLS FOR THE HIGHEST AMOUNTS IN THIS AREA...PRIMARILY FALLING FROM 12Z TO 18Z TOMORROW. A LOW CONFIDENCE IN FORECAST DUE TO LACK OF AGREEMENT AMONG HIGH-RESOLUTION MODEL GUIDANCE. THE LIFT STILL LOOKS GOOD ON THE 295K SURFACE AS THE STRONG UPGLIDE BEGINS TO COINCIDE WITH A SATURATED ENVIRONMENT BY 09Z ACROSS WESTERN MN. FOR THE METRO...2"-3" STILL LOOKS ON TRACK ACROSS THE SOUTHERN PORTION...WITH CLOSER TO 1"-2" ACROSS THE NORTH, WINDS WILL TURN NORTHWEST AND GET BLUSTERY TOMORROW AFTERNOON AS THE SNOW MACHINE SHUTS OFF.

Area Forecast Discussion

- •Go to our local website: weather.gov/twincities
- Hover over "Forecasts" on the top center, and click on "Forecast Discussion"



Weather Graphics

- We produce a "Weather Story" updated every evening and early morning, sometimes more
- In addition to reading our forecast products, you may find these very beneficial ahead of a winter storm
- You can find the weather story on our home page and our Facebook and Twitter accounts



Friday Snowstorm Is Shifting East

As of now the heaviest snow will be in west central MN to northeast MN Friday morning to Friday night.

This track will likely change slightly over the next few days, so check the forecast for updates.

National Weather Service – Twin Cities

WINTER STORM COMING



Light Snow
Begins

Mederate

FRI Heavy Snow
Begins

Light to
Moderate
Snow

SAT Light Snow
Blowing Snow
Temps Crash

SAT Snow Ending
Blowing Snow
Continues

Snowfall Amounts Fri- Sat



Precipitation Forecast for Today



Twin Cities

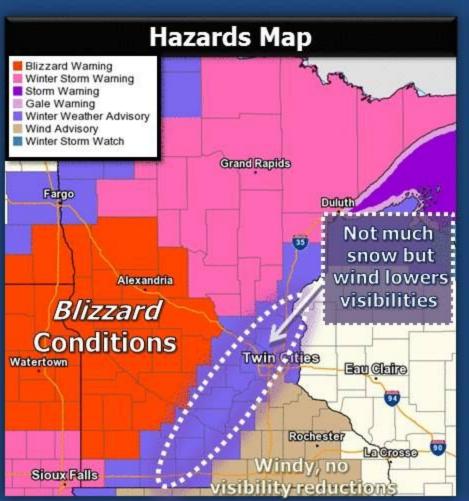








Powerful Storm Friday Blizzard for Western MN







National Weather Service



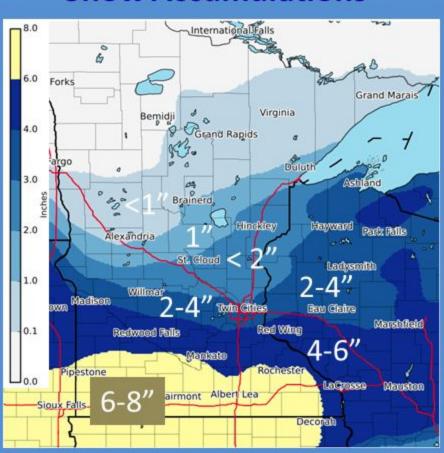
Snow Returns on Tuesday

Winter Storm Watch Tuesday into Wednesday



Stay tuned as the Watch could be expanded to the north and east

Potential Snow Accumulations



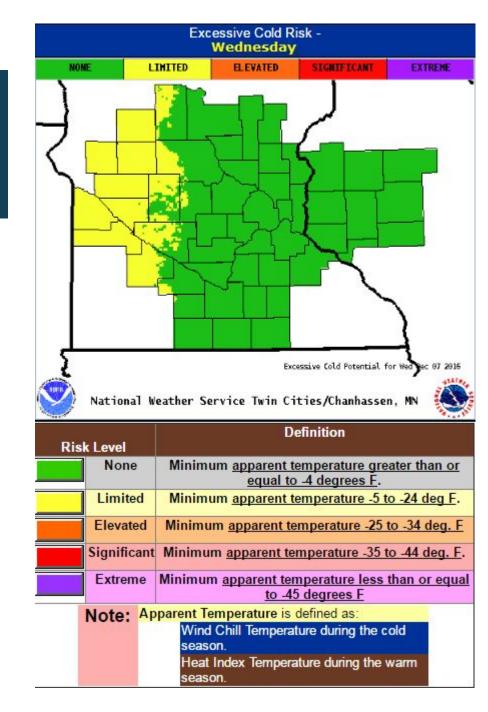
Tuesday morning thru Wednesday morning





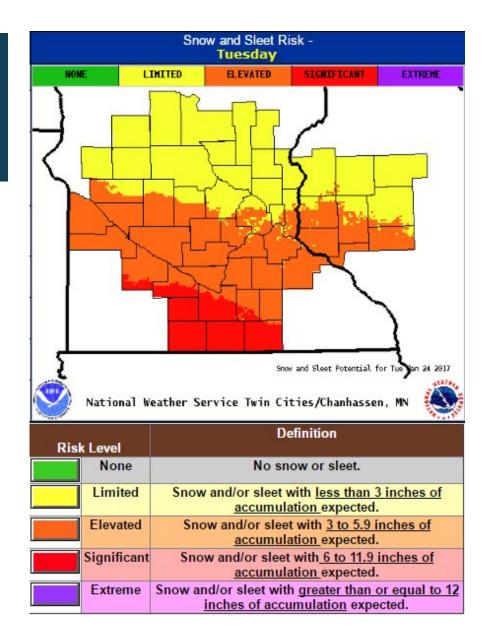
Enhanced Hazardous Weather Outlook

- Map depiction of weather threat level for different weather variables.
- Includes how each threat level is defined.



Enhanced Hazardous Weather Outlook

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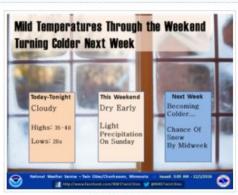
Hazardous Weather Outlook

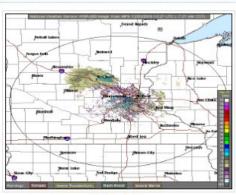
High: 36°F Tonight



Mostly Cloudy Low: 29°F

change location







Weather Story

Local Radar

Weather Map

Follow us on Twitter



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Follow us on YouTube



MPX RSS Feed

WARNINGS/HAZARDS Enhanced Hazardous Weather Outlook

WEATHER FORECASTS Snowfall/Winter Weather Aviation Forecasts Fire Weather

CURRENT WEATHER CONDITIONS

Current Weather Observations Yesterday's Temperatures and Precipitation Current Radar

PAST WEATHER RECORDS

Year-By-Year Minnesota

Tornadoes

On This Day in Weather History... Twin Cities Weather Records St Cloud Weather Records Eau Claire Weather Records

WEATHER SAFETY

NOAA Weather Radio Skywarn Spotter Activation

OFFICE ACTIVITIES

Cooperative Weather Observer

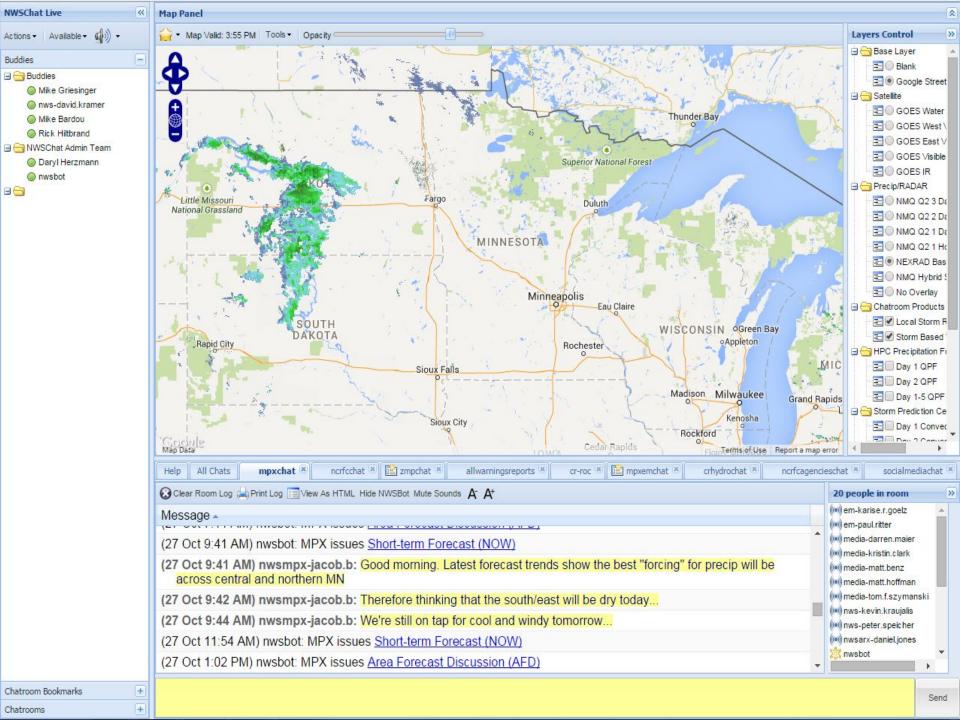
Warning Reception: iNWS

- Interactive National Weather Service
 - Weather alerts to your mobile device via text message and email
 - Select your alert area and which alerts you want

https://inws.ncep.noaa.gov

NWS Chat

- You can sign up for NWS Chat
 - Must first request access via the website
 - https://nwschat.weather.gov/
- Our office identifier is "MPX"
 - Join the "MPX Chat" room
- Chat rooms are monitored 24/7
- We respond to questions and often post more and quicker updates concerning the weather
- Sign up and chat with a meteorologist anytime day or night!



Weather Event Email Blasts (nws.twincities@noaa.gov)

- Heads-up email "blasts" are sent out ahead of high-impact events.
- Key points
 - What you need to know
 - What has changed with the forecast
 - Our confidence level
- These emails are typically sent early in the morning and sometimes late afternoon
- You will be included on these emails!

An Example (nws.twincities@noaa.gov)



NWS TwinCities - NOAA Service Account

5:24 AM (4 hours ago)



to bcc: cr.mpx -

A Winter Storm Watch remains in effect for south central Minnesota From Noon Tuesday through Wednesday Afternoon. The watch is south of a line from Redwood Falls to Red Wing. Confidence is increasing for accumulating snow of 6 inches or more within the watch area. There is still some uncertainty in overall model placement of the heavier snow band. It could shift north in later model runs so continue to monitor the latest forecast for further updates.

Hazards & Impacts:

- . Accumulating snow of 6 inches or more. The snow will be heavy and wet.
- Travel could be hazardous due to the wet snow.
- · Some blowing and drifting snow possible following the storm Wednesday.

Snowfall Amounts - Confidence Medium-High

. Potential for 6 to 8 inches across south central MN, with much of that occurring Tuesday evening.

Timing - Confidence Medium-High

- . Snow will develop into south central Minnesota Tuesday morning, with the greatest accumulation occurring late Tuesday afternoon and Tuesday night.
- · Rain could mix in with the snow briefly Tuesday morning.
- · Snow will taper off by Wednesday afternoon.

Watches/Warning/Advisories:

The Winter Storm Watch that was in effect for south central Minnesota from Noon Tuesday through Wednesday afternoon.

Please call us anytime at 952-361-6671 if you have questions.

Useful Links

NWS Twin Cities Homepage

Current Weather Story

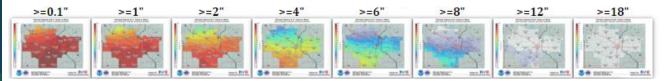
Snow & Ice Accumulation Potential

Weather Prediction Center Winter Weather Forecasts

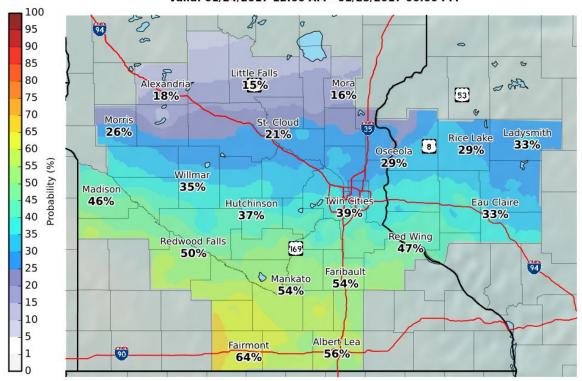
Interactive Day 4-7 Winter Weather Outlook

Snowfall Probabilities

Chances that the snow will be greater than...



Percent Chance of 6" Snow or More Valid: 01/24/2017 12:00 AM - 01/25/2017 06:00 PM





National Weather Service Twin Cities, Minnesota 01/23/2017 03:56 AM CST Follow Us:

weather.gov/twincities/winter

Mouse over desired amount and image will appear below.

- Greater than or equal to:
- 0.1"
- 1"
- · 2"
- 4"
- 6"
- 8"
- 12"
- 18"

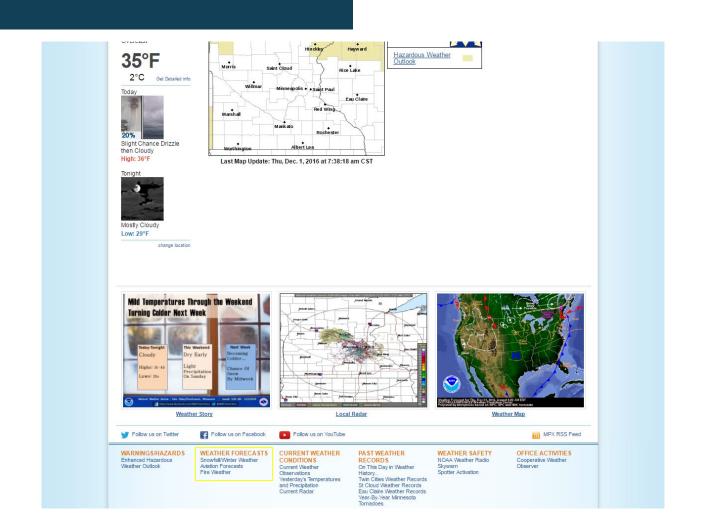
Probability of Ranges Table

Chance of Snow Accumulation Experimental - Leave feedback 01/24/2017 1200AM to 01/25/2017 0600PM What's this? County: All • Location At least Likely Potential for >=0.1" >=1" >=2" >=4" >=6" >=8" Albert Lea, MN 3 7 10 96% 93% 75% 55% 31% 3% 0% 0 1 Alexandria, MN 69% 35% 1% 0% 3 Amery, WI 1 8 90% 81% 56% 34% 17% 0% 2% 2 Andover, MN <1 85% 74% 50% 30% 15% 0% 3% Anoka, MN <1 3 91% 85% 75% 52% 31% 15% 2% 0% Appleton, MN <1 4 9 78% 59% 39% 5% 0% 1 4 10 95% 91% 85% 0% Apple Valley, MN 65% 26% 6% 3 Arden Hills, MN <1 8 91% 84% 73% 49% 29% 14% 0% 2 5 10 96% 93% 88% 71% 50% 0% Arlington, MN 30% Atwater, MN <1 4 9 77% 55% 3% 0% 34% 18% 36% Augusta, WI 1 4 8 90% 83% 60% 17% 2% 0% 4 95% 91% 84% 62% Baldwin, WI 38% 20% 3% 0% Barron, WI 4 8 54% 0% 1 80% 13% 1% <1 3 8 91% 84% 50% Becker, MN 73% 29% 15% 2% 0% 2 Belgrade, MN 0 7 89% 81% 69% 45% 26% 0% 5 Belle Plaine, MN 2 10 93% 87% 69% 47% 6% 0% 4 Bellingham, MN <1 10 80% 62% 7% 0% <1 3 9 Benson, MN 83% 74% 53% 33% 18% 3% 0% 2 Big Lake, MN 6 11 96% 93% 88% 73% 53% 33% 0% Bird Island, MN 4 61% 37% 2% 0% 3 8 Blaine, MN <1 74% 51% 2% 0% 4 8 Bloomer, WI 95% 90% 81% 55% 29% 12% 1% 0% 2 Blooming Prairie, MN 6 10 94% 89% 75% 55% 33% 0% Bloomington, MN 9 4 91% 84% 63% 41% 0% 3 7 Blue Earth, MN 11 90% 77% 58% 35% 0% 3 Boyceville, WI <1 53% 40% 27% 9% 2% 0% 0% 0% Brandon, MN 0 <1 66% 52% 28% 13% 5% 0% 0% 6 3 Brooklyn Park, MN <1 91% 85% 77% 55% 34% 19% 0%

Can switch to exceedance %

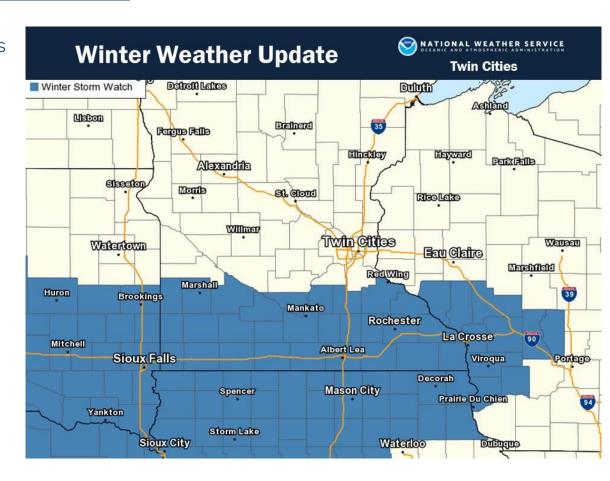
weather.gov/mpx/winter

Probabilistic Snowfall Forecasts



DSS Webinars- you will be invited via email (nws.twincities@noaa.gov)

- Our forecasters host webinars in anticipation of high-impact event. These are typically reserved for high-end weather events.
- Invitations to these webinars are always sent to the same group included on the DSS Emails.
- Forecasters use this opportunity to update you on the latest forecast and our confidence level.
- Example From December



Packaging NWS Data Together

 On the MN Association of School Administrators Website, a weather forecast section has been developed with NWS information, much of which was shown earlier in this presentation.

MASA Weather Page

Severe Weather

- Watches/Warnings are highest priority- staffing levels can be increased significantly
- Support for largeOutdoor Events
- •Convective Outlooksissued by the <u>Storm</u> <u>Prediction Center</u>







We think you should be a Weather-Ready Nation Ambassador!

- Opens up a more direct relationship with the NWS
- You will receive occasional correspondence from a Point of Contact at our office that includes helpful weather safety and preparedness info
- You commit to sharing weather safety & preparedness info in your organization and/or community- force multiplier
- About the WRN Ambassador Program Sign up now on the spot!







Questions? nws.twincities@noaa.gov

Shawn DeVinny shawn.devinny@noaa.gov Meteorologist National Weather Service Twin Cities/Chanhassen, MN

