



The Northland Sky Watcher

NWS DLH

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*For National Weather Service Weather Watchers of
northeastern Minnesota and northwestern Wisconsin.*

A Winter of Extremes

From one of the snowiest Decembers on record in Duluth, to the driest January ever observed, the winter of 2007-2008 has shaped up to be anything but tame. In the Twin Ports, December brought three significant snowfalls, while January and February combined saw only two days with snowfall greater than one inch. Temperatures were on a roller coaster, with mild stretches punctuated by Arctic outbreaks that persisted for a few days to a week.

Snowfall was variable around the region with Duluth running about a foot below normal for the winter months of December through February. Other areas lacking in the snow department this winter include the Lake Superior snowbelt region of northwestern Wisconsin where Hurley only had 100 inches of snow- a whopping 40 inches below the normal. On the other hand, International Falls received about 5 inches more snow than normal.

For the combined months of December and January, temperatures were slightly above. February was colder than normal, with temperatures averaging 3 to 5 degrees below normal. The entire season averaged slightly below normal, the first time the region has seen below average winter temperatures since the winter of 2000-2001. The following table lists the temperature departures from normal for the winter seasons (December through February) at Duluth and International Falls. Values are in degrees Fahrenheit.

- Tom Lonka, Climate Specialist

DULUTH	
Departure	Season
+6.4	1999-00
-0.8	2000-01
+8.5	2001-02
+0.3	2002-03
+2.1	2003-04
+2.0	2004-05
+5.3	2005-06
+2.7	2006-07
-1.2	2007-08

INTERNATIONAL FALLS	
Departure	Season
+8.4	1999-00
0.0	2000-01
+9.5	2001-02
+1.4	2002-03
+1.5	2003-04
+0.5	2004-05
+5.3	2005-06
+2.7	2006-07
-2.3	2007-08

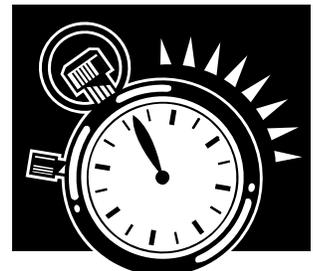


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**Tornado drill day is
April 24th.**

**Be prepared-
Seconds saves
lives!**





Gearing Up For the Thunderstorm Season

Thunderstorm season can come upon us quickly- one day we could be shoveling snow, and the next day be hammered with hailing thunderstorms. That's the weather in the Northland and it's also why we need to prepare for the thunderstorm season now.

At the National Weather Service, we gear up for the season by reviewing our severe weather procedures, having in-house drills and training.

We also revise our Skywarn training presentation to bring you the latest information and great videos. Check the schedule below for a Skywarn training session to fit your needs. No pre-registration is required- just show up and be ready to learn.

Drill, Drill, Drill! ***(or practice makes perfect)***

The statewide tornado drills for both Minnesota and Wisconsin will be on April 24th. We drill here at the NWS and you should too- whether at home, work, or school.

During the drill we issue a mock tornado watch and tornado warning, and test our procedures as if they were real. We also test our communication systems and activate all Skywarn amateur radio networks. The amateur radio networks then test their communication procedures to ensure that everything is in good working order for the real thing.

2008 Skywarn Schedule

- 3/13 Spooner, WI, Fire Hall, 507n Summit St., 6:30 pm
- 3/18 Pike Township, MN, Fire Hall, 6867 Highway 68, 7 pm
- 3/20 Siren, WI, Gov't Center, Hwy 35, 6 pm
- 3/25 Marcell, MN, Family Center, Highway 38, 2 pm
- 3/31 Hertel, WI, St. Croix Chippewa Tribal Clinic, 1:30 pm
- 4/2 Ashland, WI, Northland College Center for Science and the Environment, Rm 169, 6:30 pm
- 4/3 Grantsburg, WI, Community Center, 6:30 pm
- 4/8 Mille Lacs, MN, Grand Casino, 1 pm
- 4/9 Virginia, MN, Nichols Town Hall, 6:30 pm
- 4/10 Duluth, MN, Secondary Tech Center, Central High School, 6:30 pm
- 4/14 Palisade, MN, Fire Hall/Community Center, 6:30 pm
- 4/15 Brainerd, MN, Land Service Bldg, 322 Laurel St., 6:30 pm
- 4/16 Hinckley, MN, Grand Casino, 1 pm
- 4/17 Solon Springs, WI, Fire Station, 6:30 pm
- 4/21 Phillips, WI, Courthouse, 3 pm
- 4/21 Prentice, WI, High School library, 1025 Town St., 7 pm
- 4/22 Superior, WI, City/County Building, 7 pm
- 4/23 Walker, MN, High School, 6:30 pm
- 4/25 Grand Marais, MN, Community Center, 7 pm
- 4/28 International Falls, MN, Rainy River Community College Science Building, Room 106, 6:30 pm
- 4/29 Washburn, WI, County Law Enforcement Center, 117 E 6th St., 7 pm
- 5/5 Cornucopia, WI, Bell Community Center, 22615 CO Hwy C, 7 pm
- 5/13 Pike Lake, MN, St. Louis County Emergency Management, 5735 Old Miller Trunk Hwy, 6:30 pm

For additions and changes, check our website at www.weather.gov/dlh



A Brief Tutorial on Severe Weather Risk Categories

During the thunderstorm season, it is important for people to know their risk of experiencing severe weather on any given day. The National Weather Service makes this very easy to do through two sources- the national severe weather outlooks issued by the Storm Prediction Center (SPC)¹ and the hazardous weather outlook issued by the Duluth National Weather Service office².

The Day 1, Day 2, and Day 3 convective outlooks from the SPC serve as the backbone of severe thunderstorm forecast guidance and services from the National Weather Service. Generally, the HWO issued by the Duluth NWS office agrees pretty closely with the outlook from the SPC. However, the forecasters at Duluth have the responsibility for tailoring the national outlook to our local area of forecast responsibility, including northeast Minnesota, northwest Wisconsin and western Lake Superior.

Those who have experience using outlooks issued by the SPC know that there are three primary risk categories, "slight", "moderate", and "high", with a fourth category called "see text" to denote areas where strong storms may occur, or where there is great uncertainty about storm development. What many may not know is that several years ago, SPC forecasters began using probability forecasts for tornadoes, hail, and thunderstorm winds that now entirely drive the older "categorical" risks of slight, moderate, and high. Those probabilities are displayed on the SPC website, along with the categorical risk³. Once the probabilities are completed, they are converted to the more familiar slight, moderate, and high risk categories as illustrated below for the Day 1 outlook (it is important to know that the conversions are different for the Day 1, Day 2, and Day 3 outlooks – full details can be found on the SPC website⁴).

It is extremely important to keep in mind that a 30% probability of tornadoes is not directly comparable to a 30% chance of rain or snow that you are used to seeing in our daily forecasts. A 30% probability of tornadoes means that there is roughly a 30% chance of a tornado occurring within 25 miles of any specific point within the 30% forecast area. However, that 30% is not to be interpreted on a scale from 0 to 100%; the 30% probability must be compared to the background probability of a tornado occurring within 25 miles of a point on any given day in any given year, which is always a very low number.

For instance, the background probability of a tornado within 25 miles of a point in northeastern Minnesota in June is only around 0.35%⁵. So, if the tornado probability forecast is 5% or 10%, that is a very large number and signifies a greatly increased risk of tornado occurrence during the outlook period. **If the forecast probability is 30%, which is two orders of magnitude greater than 0.35%, that 30% figure signifies an absolutely huge risk for tornadoes, even though the 30% number still seems small on an absolute scale from 0 to 100.**

Day 1 Probability to Categorical Outlook Conversion
(SIGNIFICANT SEVERE area needed where denoted by hatching - otherwise default to next lower category)

Outlook Probability	TORN	WIND	HAIL
2%	SEE TEXT	NOT USED	NOT USED
5%	SLGT	SEE TEXT	SEE TEXT
10%	SLGT	NOT USED	NOT USED
15%	MDT	SLGT	SLGT
30%	HIGH	SLGT	SLGT
45%	HIGH	MDT	MDT
60%	HIGH	HIGH	MDT

- Dan Miller, Science and Operations Officer

¹ www.spc.noaa.gov/products/outlook/

² www.spc.noaa.gov/misc/SPC_Prob_Conv_Otlk_Change_20060214.html

³ <http://www.spc.noaa.gov/products/outlook/day1otlk.html>

⁴ www.spc.noaa.gov/misc/SPC_Prob_Conv_Otlk_Change_20060214.html

⁵ www.nssl.noaa.gov/hazard/



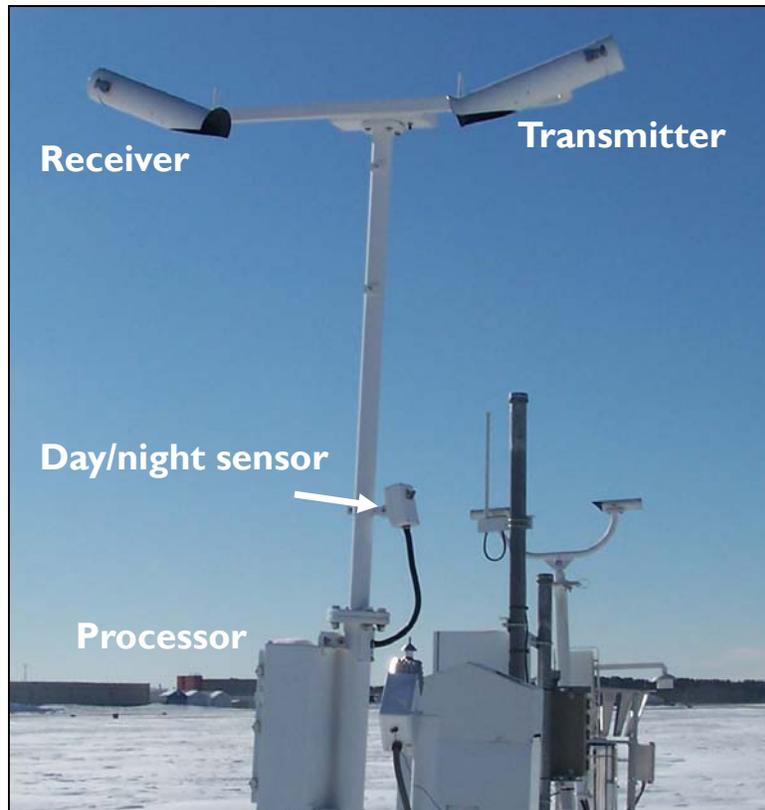
The Science Behind Visibility Sensors

You have seen them along the side of the road, on bridges, and at airports: special sensors that determine how far you can see, or the “visibility,” depending on weather and other environmental conditions. Visibility sensors used by the National Weather Service, located mostly at airports, are extremely critical, because they determine whether an aircraft can take off or land safely. Some pilots are only certified to fly when the visibility is greater than a certain threshold, generally three miles. These pilots must navigate by “Visual Flight Rules”, or VFR. Meteorologists use the data from visibility sensors to help in aviation forecasting and for determining precipitation intensity.

All visibility sensors consist of three main components: a transmitter (projector), receiver (detector), and a processor. To measure the visibility, the transmitter emits a flash of light. This light bounces, or scatters, off any weather or restriction to visibility, like fog or precipitation. The receiver measures the amount of scattered light that it receives and sends the data to the processor, where a prevailing visibility is calculated. The prevailing visibility is reported in miles, or parts of a mile. The prevailing visibility at a location is important for forecasters in order to determine fog density and precipitation intensity.

The visibility sensor is only one of many instruments installed as part of the Automated Surface Observing System (ASOS). It is a critical element of the NWS data network, specifically designed to keep aircraft flying safely. In our next newsletter, we’ll look at one of the newest sensors installed on the ASOS- the ice-free wind system.

- Don Price, *Electronic Systems Analyst*



The ASOS visibility sensor located at the Duluth International Airport.



Co-op Corner

More than 11,000 cooperative weather observers across the nation provide daily observations to the National Weather Service, including 85 dedicated members within northwest Wisconsin and northeast Minnesota.

Our office recognizes the following members of the Cooperative Observer program for serving the nation and their local communities:

Sharon Lindvall	Littlefork, MN	15 years
Ed Jacobsen	near Webster, WI	10 years
Ronald Schmidt	near Ely, MN	10 years
Linda Moe	Port Wing, WI	10 years
Eugene Pasko	Moose Lake, WI	10 years

Congratulations and thank you!

For more information on the National Weather Service Cooperative Observer Program, please visit: <http://www.nws.noaa.gov/om/coop/>.

- Steve Gohde, Co-op Program Manager



Flood Safety Awareness Week March 17-21

Did you know that flooding is the #1 storm-related killer? It's not tornadoes, severe thunderstorms, or winter storms. Flooding ranks only behind heat waves in the number of casualties for all weather events. It also takes many different forms, from river flooding to flash flooding to snowmelt flooding. It can occur in any month of the year, at any time of day, and is a threat everywhere.

More than half of all flood-related deaths are drownings that result from vehicles caught in flood waters. Eighty percent of all flood deaths occur when people drive into flooded roads or simply walk through moving water. Many of these drownings are preventable. Never drive or walk into flooded roads, sidewalks, or ravines. Do not underestimate the force of water.

Still, flooding doesn't happen very often. That's why it's important to know how to find helpful information, to prepare in advance for potential flooding, where to obtain flood insurance—if it is required in your area, and to be familiar with general safety tips that will help keep you, your family and property safe. Visit <http://www.floodsafety.noaa.gov/> for more details.

- Greg Frosig, Hydrology Program Leader



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5027 Miller Trunk Highway
Duluth, MN 55811

Phone: 218-729-6697

Editor: Carol Christenson

E-mail: carol.christenson@noaa.gov

Assistant Editor:

Mike Bettwy

E-mail: mike.bettwy@noaa.gov

The Northland's Weather Experts



Weather Survey About to Go Live!

The National Weather Service and its partners are working on a new campaign, called WAS*IS, or "Weather and Society*Integrating Studies" to integrate the fields of social science and meteorology to produce more socially relevant weather forecasts and products.

There is an online survey to gain insight into the your decision-making process during hazardous winter weather conditions. You can preview the survey from our homepage at www.weather.gov/duluth. The survey will be ready for you to take right after a winter storm. So after a winter storm, get on our website and fill out the survey. Thank you!

WAS*IS

WORKSHOPS

[weather & society](http://www.weather.gov/duluth) * [integrated studies](http://www.weather.gov/duluth)

Live NOAA Weather Radio Call-In Show

Join us for a live NOAA Weather Radio call-in show on Thursday, April 24th, 2008 at 7:00 pm! Yes, this will be a real live show hosted by actual meteorologists from the National Weather Service in Duluth. Thursday April 24th is during Severe Weather Awareness Week, so topics of discussion will include, but are not limited to, tornadoes, lightning, flash floods, damaging thunderstorm winds, hail, and severe weather safety. Be sure to watch the *Top News of the Day* headlines on our webpage for further details on this radio show, including an email address and phone number to call with any questions you might have regarding weather and/or the National Weather Service.



US DEPARTMENT OF COMMERCE
NOAA
NATIONAL WEATHER SERVICE
5027 MILLER TRUNK HIGHWAY
DULUTH MN 55811