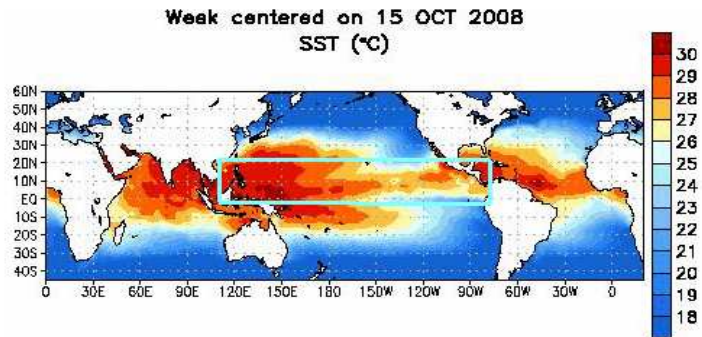




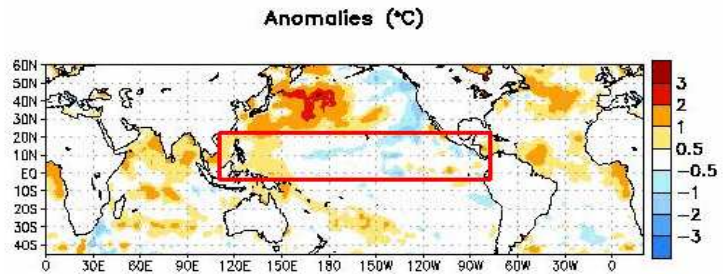
Winter Outlook: 2008/2009

Transition from La Niña to Neutral Conditions

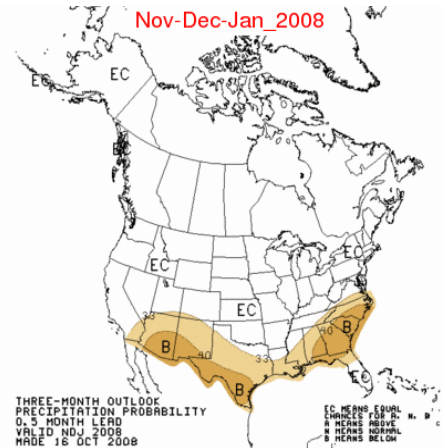
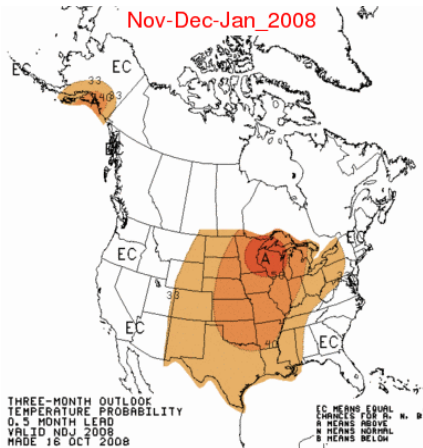
This past summer the El Niño/Southern Oscillation (ENSO) cycle transitioned from a strong La Niña to Neutral conditions. So what does this mean exactly? The basic definition is a warming of sea surface temperature (SST) across the equatorial region. The water temperatures from the surface to 300m below are averaging with in +/- 0.5° of normal.

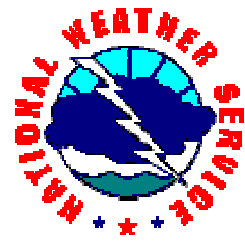


Now you are wondering, how does the SST along the equator affect the weather in the Northern Rockies? Well, substantial studies and observations have noticed a strong link between SST in the Pacific and the weather patterns over the World, including over North America. Last spring, the Spotter Newsletter had an article about expected La Niña conditions, which brought relatively wetter and cooler conditions to the Northern Rockies, especially across the Pacific Northwest into extreme Northwest Montana. This was evident in the snow pack readings during spring months.

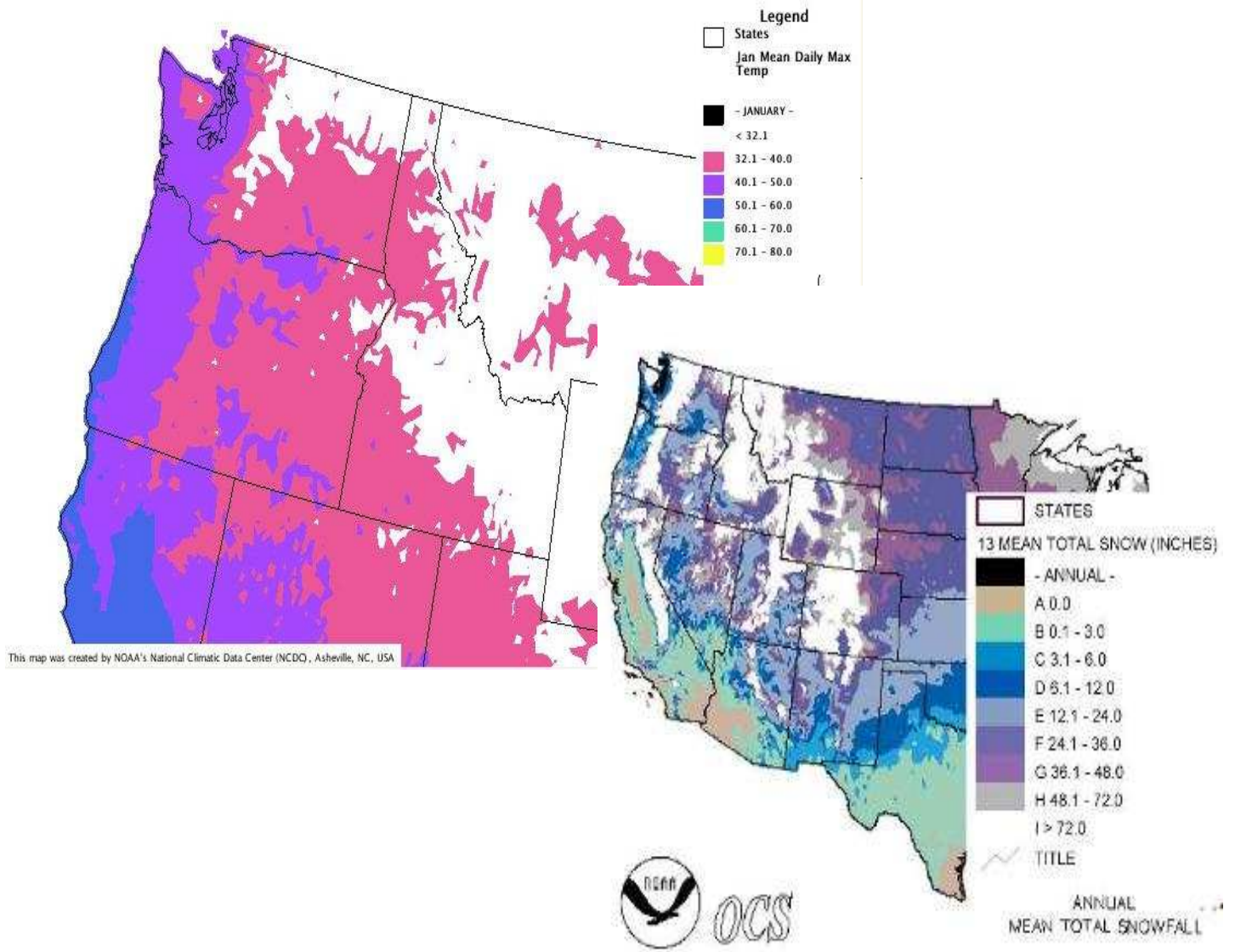


Since the ENSO cycle has returned to a neutral state, the region could see a return to near normal conditions this winter. NOAA's Climate Prediction Center is showing that the models do not have a strong indication if the region will be normal, above or below in temperatures and precipitation this winter, which is indicated by the equal chance (EC).





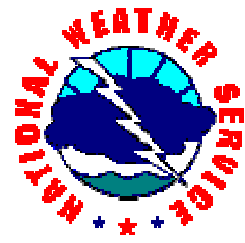
Many of you might be wondering what a typical winter in the Northern Rockies entails. The next few images will hopefully enlighten you on this aspect. The first image shows the average high temperature in January. The second image represents a typical snowfall across the United States under ENSO neutral conditions.



The following is a summary of average winter temperatures, precipitation, and snowfall for Missoula, Butte and Kalispell. Temperatures are in terms of degrees F, and precipitation/snowfall is in terms of inches.

	November			December			January			February		
	Max/Min	Precip	Snow	Max/Min	Precip	Snow	Max/Min	Precip	Snow	Max/Min	Precip	Snow
Missoula	39.9/24.1	0.95	6.2	30.5/17.0	1.09	11.2	31.2/16.8	0.92	11.3	37.3/20.4	0.70	7.0
Kalispell	38.7/23.7	1.36	8.1	29.9/16.2	1.62	13.9	29.5/15.2	1.36	12.6	35.1/18.1	1.04	8.3
Butte	39.2/15.0	0.59	M	30.2/6.0	0.50	M	30.6/5.9	0.47	M	34.9/9.3	0.45	M

Table: 1977-2007 Average Monthly Maximum Temperature, Minimum Normal and Precipitation



Life of an IMET

The National Weather Service has 123 offices scattered across the United States which provide forecasts and weather warnings across the nation. But what happens when a large event such as a forest fire or natural disaster demands more personal attention? Call in the IMET (Incident METeorologist)!

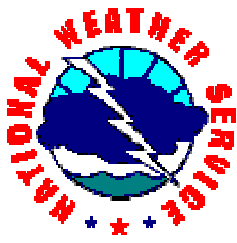


The IMET program consists of a group of meteorologists scattered across the country who are ready and willing to respond to such events. The most common dispatch is to respond to the many forest fires that occur across the country each year. Firefighters depend on accurate weather forecasts to safely fight the fire, as well as to develop the fire fighting strategy. Due to the density of fires in the western United States, the majority of IMETs reside in the western states. The IMET program has spread eastward over the years as the opportunity for dispatch has increased through events such as natural disasters (hurricanes, tornados), safety for large public events (ie/ democratic/republican national conventions), and hazardous chemical spills. When an IMET arrives at an incident, they must be able to adapt to change and overcome challenges (such as lack of power/internet access) to produce a forecast according to the parameters being requested. Many times, the complex

terrain of the west can make forecasting difficult. Very large differences can occur in temperature, humidity, and even winds from slope to valley over a small distance. These differences can play huge roles on the fire behavior. Thus, IMETs are needed to distinguish these differences and to answer any questions that may come up from the fire suppression personnel and public. Beyond forecasting duties, IMETs routinely provide weather briefings to the fire fighters and command staff, attend community meetings, provide long range outlooks, and any number of special requests to support the fire staff. The IMET has some very specialized equipment to enable them to complete their tasks in even the most remote locations. The most important is a mobile satellite receiver that allows the IMET to connect to the internet no matter the location, even in the back country of western Montana! IMETs also travel with an instrument called a theodolite, which



allows them to track movements of a small weather balloon launched from the surface. The movement of the balloon over time can reveal information on wind speed and direction aloft. There are now over 100 IMETs scattered across the country, with the need for more growing rapidly!



Staff Spotlight: Trent Smith

Name: Trent Smith
Position: General Forecaster/
Spotter Program Manager/
CoCoRaHS regional coordinator
Favorite food: Mexican
Favorite vacation: Honeymoon in
Jamaica
Favorite movie: Higher Learning
Favorite singer/band: Tim McGraw
Favorite season: Fall

Personal Information

Hometown: Sedgwick, Colorado
Status: Married with two girls



National Weather Service background:

June 2001-December 2002 Student intern Boulder, Colorado
January 2003-May 2004 Intern Goodland, Kansas
June 2004-present General forecaster Missoula, Montana

Why did you decide to be a meteorologist?

When I was in junior high, I started helping my family on the farm and began to see how much weather affected them. I wanted to be able to provide farmers with better forecasts. My uncle was a meteorologist for the National Weather Service, so I got in touch with him. He was able to provide me with books and information on the career. This eventually snowballed into my career as a meteorologist.

What is your favorite part of the job?

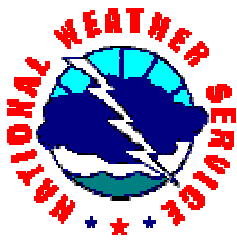
I love the fact that the weather is always changing, and that it's never the same thing. With this job, you always have to be on your toes. It's definitely a challenge to figure out what mother nature is going to throw at you!

If you had to pick another career, what would you want to do?

High school math teacher.

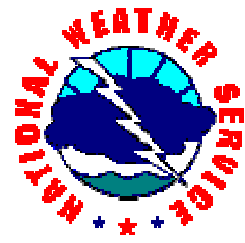
What do you do for fun outside work?

I enjoy spending time with my wife and two lovely daughters, wood working, spending time in the outdoors hiking/backpacking, and participating in church activities such as social justice and youth ministry.



Spring and Summer Storm Highlights

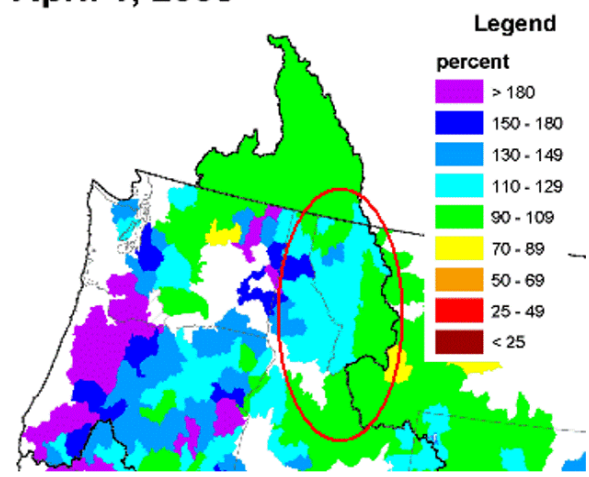
1. March 4th, 2008: An intense band of snow showers developed late in the evening of Tuesday, March 4th dropping heavy amounts of snow up to 10" between Evaro and Missoula. Because this band occurred on such a small scale, it was very difficult to predict its placement ahead of time. The heavy band of snow remained nearly stationary into the overnight hours, leading to the heavy snow accumulations in a very small area.
2. A cool and moist spring (thanks to La Niña), built up a respectable snow pack across much of the Northern Rockies. The unusually cool spring temperatures inhibited melting, allowing snow pack to remain particularly high in the mid elevations, and in some instances 200% of normal!
3. May 21st through 25th, 2008: A strong low pressure system brought winter like conditions and heavy precipitation to parts of western Montana and north central Idaho. This unusual system remained stationary over the western United States for five days, providing cool temperatures and plenty of moisture over the region. The hardest hit areas were generally focused along the continental divide, where up to 10 inches of liquid precipitation and snowfall amounts measuring in multiple feet was not uncommon!
4. August 16th through 18th, 2008: A strong ridge of high pressure formed across the Intermountain West creating some of the hottest conditions this summer. Temperatures soared 10 to 15 degrees above normal for that time of year, with many areas setting new daily records. A few locations even warmed to the century mark, including Missoula, Superior, and Thompson Falls.
5. August 31st through September 1st: A potent low pressure system impacted north central Idaho and western Montana with a multitude of weather conditions. Strong thunderstorms jump started the system on the 31st, with frequent lightning, heavy rain, and hail ranging in size from $\frac{1}{4}$ to $\frac{3}{4}$ of an inch in diameter. Soaking rains then followed through the night into Sept 1st, with some locations near the Continental Divide receiving accumulating snow between 1 to 5 inches above 5000 feet.



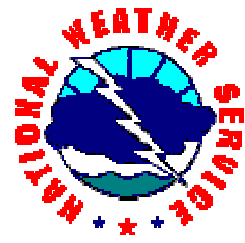
2008 Fire Season Summary

What happened to the smoke? Western Montana and north central Idaho had a much needed break from the busy fire seasons of the past this summer. But why exactly? While there were several hot and dry spells during the period, the region also received a few precipitation events spread over the summer. This was partly due to the weakening La Niña conditions over the Pacific Ocean. La Niña typically makes for hot and dry conditions over the Pacific Northwest, as was seen during the summer of 2007. However, with the weakening La Niña this summer, the jet stream (band of strong winds aloft) was able to shift further south, bringing periods of cooler temperatures and precipitation. Additionally, a well above normal snow pack remained in place through May and early June, slowing the drying of mid and high elevation plant life. Below is an image of the Pacific Northwest showing percent of normal snowpack for April 1st.

**Mountain Snowpack
as of April 1, 2008**



There were 158,765 acres burned by wildfire across Montana this year. In comparison, the 10 year average (1998-2007) of acres burned in Montana each year is 411,324 acres. For north central Idaho, 13,688 acres burned this year compared to the 10 year average of 49,563 acres. Clearly this was a much quieter year compared to summers of the past 10 years.



Anaconda Observer Receives Holm Award

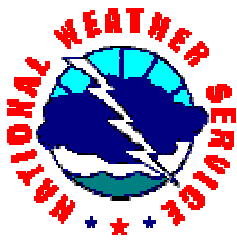
The National Weather Service relies on weather observations taken across our assigned area of responsibility to aid in the forecast and warning process. This information is especially important in the complex terrain of western Montana and north central Idaho as extreme differences in temperature, wind, and even precipitation can exist across very small distances. Therefore, the National Weather Service in Missoula has an extensive observation network set up across the region to record information on temperatures, precipitation, etc. on a daily basis. Human observations are an important part of the observation network, and thus our cooperative observers (as they are called) are valued tremendously. One such observer is Don Nyquist, who has observed and communicated the weather in Anaconda, MT for the past 26 years. He was recently awarded the Holm award, the second highest award given to cooperative observers, for his outstanding service in maintaining an accurate and unbroken climate weather record. Only 25 such awards are given out each year across the entire nation!



Pictured above: Susan Nelson (Western Region CPM, Richard Reisenauer (back-up observer), Don Nyquist, Carley Nyquist (Don's mother), Dirk Nyquist (Don's brother)

Don is a lifelong resident of Anaconda and considered the “weather expert” for the community and surrounding area. Over the years, he has conducted many environmental and climate studies for private and government entities and authored informative and entertaining articles published in the local newspaper.

The National Weather Service would like to thank Don for his hard work and dedication to the cooperative observer network!



Dear Weather Spotter:

The National Weather Service in Missoula is continuing to enhance its weather spotter network through a volunteer program: The Community Collaborative Rain, Hail, and Snow Network (CoCoRaHS). In addition to current duties as a weather spotter, please consider volunteering for this great program to assist us in accomplishing our mission to protect lives and property by issuing accurate and timely weather forecasts and warnings.

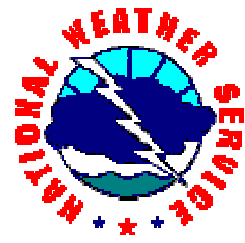
The CoCoRaHS program is a unique, non-profit, community-based, high-density network of volunteers who take daily measurements of rain, hail, and snow in their backyards and record the information on the CoCoRaHS website. Observations are immediately available to view in map and table form for the National Weather Service, media and public. The program was born in 1998 with a few dozen volunteers in Colorado. As more volunteers were recruited, enough data became available for rainfall maps to be produced for every passing weather system or storm. The new data uncovered fascinating local patterns that were valuable for both the National Weather Service and local residents. CoCoRaHS continues to grow and now has thousands of volunteers. The State of Idaho will be added to the program on January 1, 2009, and Idaho State Climatologist Russell Qualls will head the program with support from the National Weather Service offices across the Northern Rockies. Montana continues to be a vital part of the CoCoRaHS network. We encourage you to read more information about this program at www.cocorahs.org before making the decision to volunteer. The Idaho CoCoRaHS training session dates and locations can be found by clicking on the state of Idaho at www.cocorahs.org.

If you are interested in volunteering for this program or have questions, you can email me at trent.smith@noaa.gov or call 406-329-4840 and ask for Trent, Jenn or Peter.

Sincerely,

Trent Smith
CoCoRaHS Focal Point
National Weather Service
Missoula, MT

Community Collaborative Rain, Hail & Snow Network



2008 WINTER PHOTO CONTEST!!

The National Weather Service in Missoula invites **you** to enter your best weather picture in our first annual weather photo competition.

The essence of the contest is to showcase beautiful weather photos across the Northern Rockies or even the world. Your personal photographs capturing our weather are eligible for the competition.

The winner's image will be printed in the next issue of the Spotter Newsletter in Spring 2009. The newsletter reaches hundreds of people across Western Montana and North Central Idaho.

How to Enter

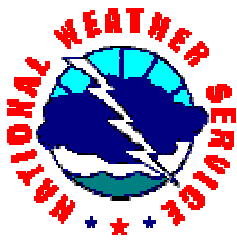
Please provide your name and a short description of the image, including the location the photograph was taken.

Mail your photo to: National Weather Service
Attn: Photo Contest
6633 Aviation Way
Missoula, MT 59808

Or email to: w-mso.webmaster@noaa.gov with subject line "Photo Contest"

The Rules

The competition is open to any United States resident, preferably from Montana and Idaho. The images are required to have been captured by the submitter or immediate relative. Photos need to be received or postmarked by February 1, 2009. Please submit a copy of non-digital photos since they will not be sent back at the end of the competition. The National Weather Service is not responsible for any lost or damaged photographs.



National Weather Service

Missoula Montana

Spotter Network Reporting Procedures

When you observe or hear of weather conditions that meet or exceed the criteria listed below, telephone your report immediately to the National Weather Service office in Missoula. Our toll-free number is:

1-800-676-6975*

- **High Wind** – 40 mph or more sustained or gusts. (Please use table below to estimate wind speeds.)
- **Heavy Snow** – Snowfall rates of one inch or more per hour. 6 inches in 12 hours or 8 inches in 24 hours
- **Dangerous Wind Chills** - Minus 10 degrees or colder. (Please use table below to estimate wind chills)
- **Freezing Rain** – (falls a rain, freezes on impact)
- **Visibility** – less than ¼ mile for any reason (e.g. dense fog, smoke)
- **Heavy Rain** – one half of an inch or more per hour
- **Flooding** – any kind (e.g. rivers/streams abnormally high, water over roads, debris flows, ice jams)
- **Damage, Deaths and/or Injuries** that are weather related
- **Hail** – Any size (Please use table below to estimate hail size.)
- **Tornado** (on the ground), **Funnel Cloud** (not touching on ground) or **Waterspout** (tornado over water)
- **Unforecasted weather**

When calling in your report, please tell us briefly:

- ✓ **Who you are and where you are calling from**
- ✓ **What you have seen** (hail, high winds, heavy snow, etc.)
- ✓ **Where you saw it** (i.e. 4 miles West of Missoula)
- ✓ **When you saw it** (the time of your observation)
- ✓ **What it was doing** (movement, damage observed, trends – i.e. snowfall is becoming heavier, etc.)

*Unlisted number, Only for weather reporting

Wind Speed Estimates (MPH)

- 25-31** Large branches in motion
- 32-38** Whole trees in motion
- 39-46** Twigs break off trees; wind impedes walking
- 47-54** Slight structural damage; branches break
- 55-63** Trees uprooted; considerable structural damage
- 64-74** Considerable structural damage
- 75+** Peels surface off roofs; windows broken: trailer

Wind Chill Chart

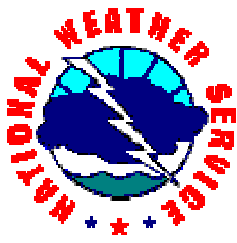
		Temperature (°F)																	
		40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
Wind (mph)	5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
	10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
	15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
	20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
	25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
	30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
	35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
	40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
	45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
	50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
	55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98	

Frostbite Times: 30 minutes (light blue), 10 minutes (medium blue), 5 minutes (dark blue)

Wind Chill (°F) = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})
 Where, T = Air Temperature (°F) V = Wind Speed (mph) Effective 11/01/01

Hail Size Estimates (Inches)

- Pea.....1/4
- Penny.....3/4
- Nickel.....7/8
- Quarter.....1
- Half Dollar....1 1/4
- Ping Pong.....1 1/2
- Golf Ball.....1 3/4
- Lime.....2
- Tennis Ball....2 1/2
- Baseball.....2 3/4
- Soft Ball.....4



Spotter Training for Winter 2008/2009

We will be holding several spotter training sessions throughout our forecast area this winter. To balance our overall spotter network, we will be focusing our recruiting efforts in regions where we have few spotters in densely populated areas. If you know of anyone from the regions listed in the schedule below, please invite them to the upcoming training sessions. Details on the times and locations will be sent in the mail in the coming months. Thank you for your dedication to the National Weather Service.



- December 8th 2008 – Kalispell / Bigfork, Montana
- January 22nd 2009 – Noxon, Montana
- January 28th 2009 – Charlo / Pablo, Montana
- February 5th 2009 – Cottonwood, Idaho
- March 25th 2009 – Lemhi/Baker, Idaho



National Weather Service Missoula, Montana

Snowfall Reporters

Please remember to call us whenever you receive at least one inch of new snowfall from a storm

1-800-676-6975

Thank you again for all that you do for us!

National Weather Service – Missoula, Montana
6633 Aviation Way
Missoula, MT
59808
406-329-4840