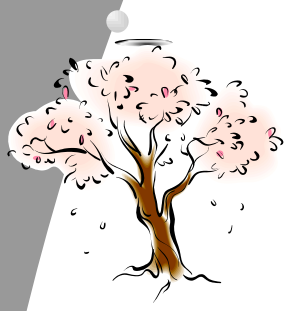
April 2011
Spring/Summer Issue

Online version available at:
http://www.wrh.noaa.gov/byz/jargon/spring11.pdf

Jetstream Jargon

National Weather Service—Billings, Montana
weather.gov/billings



Points of Interest

- Normals
- NWS on Facebook
- Frost/Freeze Data
- Nature Quiz

Inside this issue:

True Value: Community Service

Submitted by: Keith Meier
Meteorologist in Charge

One of my personal joys of growing up and living in "rural" America is the quality of the people and their commitment to community service and going out of their way to assist their neighbors.

I am constantly reassured by this commitment to community service when I interact with our numerous weather spotters, CoCoRAHS observers, and Cooperative Weather Observers. Despite being busy in each of your personal lives, you still find time to provide us with the invaluable, firsthand observations of weather and climate.

In the near future, I hope to be able to recognize those weather spotters that proactively call our office or email us with reports of snowfall, rainfall, hail, winds, etc. We are in the beginning stages of being able to accomplish this. My hope would be to somehow recognize those weather spotters that go above and beyond assisting their neighbors by providing us with weather reports. These reports often serve as the basis for, or validate our various warnings.

Our Cooperative Weather Observers faithfully document the local climate of their area by daily recording of high and low temperatures, rainfall and snowfall. These routine observations provide the basis for documenting not only the local climate, but also contribute to documenting the climate of the state and the nation. Additionally, this data is utilized by other agencies, such as the USDA, to determine if various agricultural-related assistance programs are triggered. If the observations are missing or are too intermittent, the data will not be used as a basis for those decisions. As you can imagine, this may create holes in the weather data for a county and may not be representative of what actually occurred, but in the absence of data it is the best that can be assumed.

A number of our Cooperative Weather Observers have been providing their observations to our office on a daily basis by entering their observations through the Internet (WxCoder), through an automated phone prompting service (IVROCS), or by calling directly into our office for our staff to record. All of these methods allow us to make this data available to the world in real-time instead of waiting until the middle of the next month.

After reviewing statistics for the last year, I wanted to again recognize three groups of our Cooperative Weather Observers, listed by station, who have achieved three levels of service — by sending in real-time observations more than 90% of the time (Gold level), 80% of the time (Silver level) and 70% of the time (Bronze level).

Please note those stations with an asterisk (*) next to the name are repeating in this category and those station **names in bold** have moved up a category. Of our 68 manual reporting sites, 23 of them (roughly 34%) report their data in real-time (through the methods discussed above) over 70% of the time. This is an increase of 3 stations over 2009 and is outstanding!

If you are interested in finding out how to get your data to us earlier, please contact our Observing Program Leader, Carolyn Willis by emailing her at: carolyn.willis@noaa.gov or by calling 406-652-0851. She can set you up to enter your observations in real time.

Great work, folks!

Real Time Observations Received, Station Percentages

GOLD (over 328 daily observations sent – 365 possible days)
Gardiner *
Story, WY*
Huntley *
Hysham *
Hardin *
Broadus *
Mystic Lake *
Roundup 15SW *
Powderville 8NNE *
Ekalaka
Rapelje 4S
Cooke City

SILVER (over 292 daily observations sent – 365 possible days)
Roundup *
Ryegate 18NNW *
Columbus *
Billings Water Treatment Plant *
Nye
Joliet
Clearmont, WY
Livingston Airport (manual precipitation gage)

BRONZE (over 255 daily observations sent – 365 possible days)
Plevna
Belltower
Biddle 8 SW
Burgess Junction, WY

The JetStream Jargon is published semi-annually by the National Weather Service in Billings, Montana.

Questions or comments, please email: carolyn.willis@noaa.gov or call 406-652-0851.

Coop Corner

Articles on this Page Submitted by Carolyn Willis
Observing Program Leader

Cooperative Weather Observer Needed for Judith Gap Area

If you live in or near the town of Judith Gap, and are interested in providing weather readings once a day as a part of the Cooperative Observing Network, please contact us. We would provide temperature and precipitation recording equipment and training on how to take the readings. You may phone the readings in to us, or enter them on the Internet at 7am each morning. If absent for a few days, the temperature equipment allows you to go back in the memory and see what the high and low temperatures were for previous days. Cooperative observations are used by a variety of people, companies and agencies, such as Utility Companies, Agricultural agencies, shipping companies, as well as the National Weather Service. Please contact Carolyn Willis,
Observing Program Leader, at 406-652-0851 or by email at carolyn.willis@noaa.gov if you are interested.

Upcoming Coop AWARDS for 2011

We would like to recognize these observers for the following milestones:

Dick Herriford - Gardiner - 20 years Length of Service
Mike and Mitch Mather - Wilsall 8ENE - 10 years Length of Service
Perry and Nathan Anderson - Melville 4W - 10 years Length of Service
Dave Mader - Biddle 8SW -10 years Length of Service
Ennis and Susan Geraghty - Columbus - 10 years Length of Service
Stacy Brown - Powderville 8NNE- 10 years Length of Service

Check your Rain Gages

Whether you have an 8” metal or 4” plastic precipitation gage, it’s time to start thinking about putting the funnels and inner tubes in your gages. If you do this too early, the water will freeze and break the bottoms of the inner tubes. Although the metal tubes are sturdier than plastic, freezing can still pop the weld in the bottom of the tube, causing it to be inaccurate. The last week of May is the usual time to put the tube into your gage. Before you put your gage back together for summer reporting, take time to pour a cup of water into the inner tube while it is sitting on a flat, dry surface, and check to ensure it’s not leaking. If it is, please let me know so I can send a replacement tube to you. Don’t try to repair the tube bottoms yourself, as they usually don’t seal properly, and will still leak, giving inaccurate readings. Also, for those of you with 8” metal gages, make sure your measuring stick is readable. If it’s getting worn, and the numbers and tick marks are hard to see, please let me know and I will send you a replacement.

Community Collaborative Rain, Hail and Snow Network

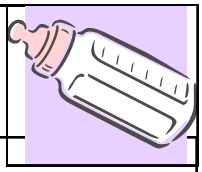
Submitted by Vickie Stephenson, Hydrometeorological Technician
Local CoCoRaHS Coordinator, Billings

Our spotters and other weather enthusiasts are invited to join the Community Collaborative Rain, Hail and Snow Network, CoCoRaHS, as it is abbreviated, (pronounced *cocoa roz.)* This program is a great way to learn about the weather and share your precipitation data with not only the National Weather Service, but friends and neighbors as well. All you need is internet access, a bit of time to complete online training, and an interest in weather. These reports become even more crucial during inclement weather to help our forecasters in the decision making process, as well as help verify the validity of our warnings after events.

The National Weather Service relies on spotter and CoCoRaHS observer reports to supplement Doppler radar information and automated station reports every day of the year. So, the next time you get hail, strong winds, heavy rain or accumulating snow, let us know! Remember, we are available 24/7 and want your reports. Your report may help save a life! For more information, go to http://cocorahs.org. Feel free to call me at (406) 652-1916 or email at vickie.stephenson@noaa.gov, if you have questions or concerns.

Family Updates

Submitted by Carolyn Willis
Observing Program Leader



Science and Operations Officer Marc Singer, and his wife Mikaela, welcomed daughter Niemi Hope into their family in November. Niemi weighed in at 8 pounds, 3 ounces.

Nature Quiz

Can you identify the animal above and the insect to the right? Answers on page 6.

Photos by Carolyn Willis

National Weather Service Billings Joins Facebook

Submitted by Matt Solum
Meteorologist

The National Weather Service (NWS) Forecast Office in Billings is one of a few select offices from around the country testing Facebook as part of its day to day operations. The content posted on the page will be similar to what you already see on our regular web page, but it's another way for us to interact with our customers and friends. Posts include information on upcoming storms, observed conditions, outreach activities, preparedness, weather facts, trivia and much more.

Currently, we have just over 800 visitors who follow our posts, and we'd love to see this number jump to over 1000 this spring! You may find us by going to **http://www.facebook.com/US.NationalWeatherService.Billings.gov** or go to our regular web page (**weather.gov/Billings**) and click on the Facebook link on the left hand menu. By clicking on "Like," our page will show up on your Facebook feed, and you can stay informed of potential upcoming severe weather. Also, feel free to interact with us by commenting on our posts, and sharing your weather reports.

Join Us for Another Round of Skywarn Spotter Training

Submitted by Tom Frieders
Warning Coordination Meteorologist

It's that time of year again and Storm Spotter Training is underway. The National Weather Service relies on our trained volunteers to supplement Doppler Radar information regarding severe storms and tornadoes. These weather reports from trained spotters, along with our Doppler Radar, are critical to our forecasters for issuing warnings for tornadoes, severe thunderstorms, and flash floods.

Come join us for an enjoyable training session in a neighborhood near you. Topics discussed include severe thunderstorms that produce damaging winds, large hail, tornadoes and flash floods. Severe weather and lightning safety will also be discussed. Remember all that severe weather that occurred across the region last summer? Well, you'll also see a review of our past years' events.

Anyone interested in becoming a trained weather spotter or interested in severe weather is invited to attend. Also, for those who have joined us in the past, we'd love to have you join us on an annual basis for a refresher. Our current schedule of training can be found on our website at: http://www.wrh.noaa.gov/byz/local_news/2011/spotter11.php

If you can't attend in person, we are offering another opportunity this spring for current spotters and observers. View the presentation from the comfort of your home via an online webinar scheduled for May 17th at 7pm! Register for the webinar at the link below, log on just minutes prior to the training to see the slides and call in on a conference call line to hear the audio. It's easy and free!

Space is limited. Reserve your Webinar seat now at: https://www1.gotomeeting.com/register/428175561

Electronic Storm Reporting Increases

Submitted by Tom Frieders
Warning Coordination Meteorologist

Besides the implementation of e-spotter (http://espotter.weather.gov/) a few years ago and Facebook in December, we have seen a significant increase in the use of e-mail to send reports electronically. Most of you have seen our e-mail request prior to or during major winter storms this past winter. We started this process late last winter with a limited number of e-mail accounts on our distribution list. From March through June of 2010 we received about 50 e-mail weather reports. Over the summer, we made significant strides in this effort by contacting many of you requesting e-mail addresses. Through this enhanced distribution list, e-mail reporting increased to nearly 300 from December 2010 through February 2011. Two storms in particular (around the New Year and February 7) brought in over 200 e-mail reports. Just imagine us having to make over 200 calls in a matter of a couple days without this added feature!

We certainly appreciate your time and effort. Each report received in our e-mail account is immediately forwarded to our forecasters providing them real time information. Even if you don't hear back from us (our process won't allow us to immediately reply), please know that your reports are appreciated.

Add billings.nws@noaa.gov to your e-mail address book. Send us your e-mail the next time you have something to report. If you are not already on our distribution list, send us an e-mail with your name and location and we'll set you up. We are looking forward to your next report!

June 30, 2001 - A thunderstorm at 1am produced baseball sized hail and 80 mph winds in Ashland. Storm tops reached 70,000 feet. Many windows and windshields were smashed and birds in trees were killed.

June 18, 2002

4.50 inch hail from a thunderstorm was reported in Alzada.

Are you Prepared For Severe Weather?

Submitted by Kurt Hooley
Meteorologist
http://www.nws.noaa.gov/om/severeweather/index.shtml

Severe weather season is just around the corner and we here at the National Weather Service hope that you take the time to better understand your risks associated with severe thunderstorms (gusty winds, large hail and tornadoes), know what you can do to prepare for severe thunderstorms, and know what actions you can take before and during a severe thunderstorm.

Understand Your Risk:
Tornadoes cause an average of 62 deaths and 1500 injuries each year, can produce wind speeds in excess of 250 mph, can be one mile wide and can stay on the ground over 50 miles. High winds can exceed 125 miles per hour and can cause damage equal to that of a tornado. Hail, which can be larger than a softball, can cause more than $1 billion in crop and property damage each year.

Know What to Do
Review severe weather safety information and preparedness tips so you will know what to do if you are faced with the threat of severe weather. Visit the National Weather Service Website at: http://www.nws.noaa.gov/om/severeweather/index.shtml for more details.

Know the differences between severe thunderstorm/tornado watches and severe thunderstorm/tornado warnings:

A severe thunderstorm **watch** means conditions are *favorable* for severe thunderstorms. A severe thunderstorm **warning** means a severe thunderstorm *is occurring or is imminent*.

A tornado **watch** means conditions are *favorable* for the development of tornadoes. A tornado **warning** means a tornado *is occurring or is imminent*.

Take Action
Knowing what to do before and during a thunderstorm can save your life and the lives of those around you.

Before severe weather occurs:
- Create/implement a family disaster plan. Make sure your family knows what do to, where to go and who to contact in case of a severe weather emergency.
- Have a disaster supply kit handy. Include first aid, sanitation/hygiene items, etc.
- Monitor the weather. NOAA Weather Radio All Hazards or your local media are great sources of information regarding the potential for severe thunderstorms.
- Move your vehicle to a sheltered area to minimize potential damage.

During a severe thunderstorm:
- Immediately seek a safe shelter. A sturdy, reinforced building offers the best protection from severe winds, hail and tornadoes. Vehicles are not the best shelters. Many people are injured or killed when they remain in their vehicles during a severe thunderstorm. If caught outdoors as a tornado approaches and there are no buildings nearby, seek shelter in the lowest spot you can find. Ditches and culverts may provide some shelter from a tornado.
- Stay away from windows and doors. Hail and tornado/wind-generated debris slamming into buildings can break glass and pierce through walls, injuring those nearby.
- Maintain a heightened sense of awareness, even if the thunderstorm is some distance away – large hail can fall several miles away from an active severe thunderstorm; severe straight-line winds can race many miles ahead of the severe thunderstorm that is producing them.
- Do not drive into a severe thunderstorm. Heavy rain may obscure a large tornado within the storm.
- Do not drive across flooded roads.

Spring Normals

Submitted by Sean Campbell
Meteorologist

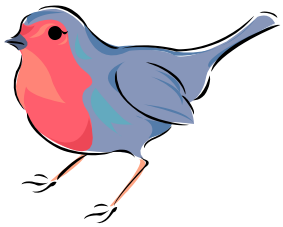
Meteorological spring includes the months of March through May. Here are the average temperatures and precipitation for Billings, Miles City and Sheridan for the spring season. Averages are 30 year averages calculated from 1971 to 2000. All temperatures are in degrees Fahrenheit and all precipitation amounts are in inches.

Billings					
Date	**High**	**Low**	**Average**	**Precipitation**	**Snow-fall**
3/1 – 3/31	47.6	26.4	37.0	1.12	10.3
4/1 – 4/30	57.5	34.7	46.1	1.74	7.6
5/1 – 5/31	67.4	44.0	55.7	2.48	1.8
3/1 – 5/31	57.3	34.8	46.1	5.34	20.0

August 22 - 2006

The Emerald Hills fire took off, eventually burning over 3800 acres in Lockwood. The Derby Fire was ignited by lightning 15 miles south of Big Timber burning nearly 200,000 acres, and wasn't contained until October.

Miles City				
Date	**High**	**Low**	**Average**	**Precipitation**
3/1 – 3/31	46.1	23.7	34.9	0.58
4/1 – 4/30	58.8	34.5	46.7	1.40
5/1 – 5/31	69.5	44.9	57.2	2.19
3/1 – 5/31	58.1	34.4	46.3	4.17



Horses in the tall grass. Photo by Carolyn Willis

Sheridan				
Date	**High**	**Low**	**Average**	**Precipitation**
3/1 – 3/31	48.2	22.5	35.4	1.00
4/1 – 4/30	57.5	30.4	44.0	1.77
5/1 – 5/31	66.4	38.6	52.5	2.41
3/1 – 5/31	57.3	31.0	44.1	5.18

June 20, 1999

Large F2 tornado north of Baker during the evening; cattle shed destroyed; large irrigation pipe twisted and moved 100 yards; tornado sucked water out of a section of Beaver Creek

Answers to "Nature Quiz" from Page 3
Left - Pine Marten, Silver Gate, Montana
Right - Praying Mantis, Billings, Montana

Summer Normals

Submitted by Sean Campbell
Meteorologist

Meteorological summer includes the months of June through August. Here are the average temperatures and precipitation for Billings, Miles City and Sheridan for the summer season. Averages are 30 year averages calculated from 1971 to 2000. All temperatures are in degrees Fahrenheit and all precipitation amounts are in inches. Snowfall amounts can include hail.

August 25, 1992
Record coldest August temperature in Billings, 35 degrees; this was the 3rd consecutive day with a low temp in the 30s in Billings.

Billings					
Date	**High**	**Low**	**Average**	**Precipitation**	**Snowfall**
6/1 – 6/30	78.0	52.5	65.2	1.89	Trace
7/1 – 7/31	85.8	58.3	72.0	1.28	0.0
8/1 – 8/31	84.5	57.3	70.9	0.85	Trace
6/1 – 8/31	83.0	55.6	69.3	4.02	0.0

Miles City				
Date	**High**	**Low**	**Average**	**Precipitation**
6/1 – 6/30	79.9	54.2	67.1	2.42
7/1 – 7/31	87.9	60.2	74.1	1.61
8/1 – 8/31	86.8	58.9	72.9	1.16
6/1 – 8/31	84.9	57.8	71.4	5.19

July 21, 1931
High temperature reached 101˚F in Red Lodge!

August 7, 1983
Record hottest August temperature in Sheridan, 106˚F.

Sheridan				
Date	**High**	**Low**	**Average**	**Precipitation**
6/1 – 6/30	76.4	46.8	61.6	2.02
7/1 – 7/31	85.2	52.4	68.8	1.11
8/1 – 8/31	84.9	51.5	68.2	0.80
6/1 – 8/31	83.0	51.0	67.0	3.93

Frost and Freeze Information

Submitted by Sean Campbell
Meteorologist

Many people will start planting their gardens and crops over the next couple of months. Two important dates to keep in mind are the last occurrence of frost and freeze in the spring/summer. The following are the average last frost and freeze dates for Billings, Miles City and Sheridan. The frost temperature is based on 36 degrees Fahrenheit and the freezing temperature is based on 32 degrees Fahrenheit. The average dates are based on a 30 year average from 1971 to 2000. The last frost and freeze dates are based on a period of record. Recordkeeping began for the Billings Airport in 1934, the Miles City Airport in 1937 and the Sheridan Airport in 1934. Additional information is available on our webpage- www.weather.gov/billings in the Climate section of the menu on the left side of the page. Select Climate>Local>Local Data/Records and under the Climate Data heading, the last three selections are gardening brochures.

City	Average Last Frost	Latest Frost on Record	Average Last Freeze	Latest Freeze on Record
Billings	May 14	June 13	May 4	June 13
Miles City	May 14	June 18	May 6	June 8
Sheridan	June 7	July 30	May 18	June 24

Coop Observers' Photos

Submitted by Carolyn Willis
Observing Program Leader

Three cooperative observers in our area won national awards during the past year.

Lucille and Don Ottesen (Sonnette 2WNW) receive the John Companius Holm Award from Keith Meier, MIC Billings. Photo by Carolyn Willis.

Alex Collie (MacKenzie) receives a 60 year Length of Service Award. Alex has taken observations longer than any current observer in Montana! Left to right, Keith Meier, (MIC Billings), Alex Collie, Bob Tibi (Former NWS Western Region Director.) Photo by Carolyn Willis.

Eunice Achtenberg, (Hysham), receives the John Companius Holm Award. From left, Keith Meier (MIC Billings), Eunice Achtenberg (observer), Virgil Achtenberg, (observer's husband), Vickie Nadolski (NWS Western Region Director). Photo by Vickie Stephenson.

June 1, 1951, was a very cold day. Highs at Billings, Sheridan, and Miles City were 36, 38, and 40, respectively. These are still the record coldest maximum temperatures for each city.

July 12, 2006 - Severe thunderstorms produced widespread damaging winds from Musselshell and Yellowstone Counties eastward to the Dakotas; 60-75 mph gusts; trees and power lines downed. Strong winds caused significant wildfire spread in Yellowstone County; together, the Pine Ridge Complex and Bundy Railroad Fire eventually burned over 230,000 acres.

Weather Spotter Word Search
Carolyn Willis, Observing Program Leader

T	S	T	S	S	T	O	R	N	A	D	O	O	E
R	L	R	N	T	S	R	U	B	O	R	C	I	M
R	M	L	I	M	L	S	P	O	T	T	E	R	F
T	S	O	A	R	W	A	L	L	C	L	O	U	D
G	A	D	R	O	E	F	R	I	E	R	N	E	L
S	A	H	Y	T	H	N	T	G	W	N	B	I	N
T	L	A	V	S	A	F	A	A	E	R	G	I	S
E	L	I	A	R	C	M	R	L	I	H	S	E	F
H	A	L	E	E	A	N	C	S	T	D	A	T	Y
C	F	S	H	D	I	L	E	N	D	B	F	I	T
F	N	T	I	N	O	D	I	I	U	L	E	T	L
E	I	O	G	U	G	N	O	I	T	A	T	O	R
O	A	N	D	H	G	G	A	N	N	I	Y	T	O
A	R	E	Y	T	I	C	O	L	E	V	N	R	C

LARGE HAIL
RAINFALL
WARNING
DAMAGE
FUNNELCLOUD
WALLCLOUD
FLASH FLOOD
MICROBURST
LIGHTNING
VELOCITY
SPOTTER
DEBRIS
TORNADO
ROTATION
THUNDERSTORM
HEAVYRAIN
HAILSTONE
SAFETY

(Answers on Page 10)

Mammatus clouds during a thunderstorm over Billings.
Photo by Carolyn Willis

What are Mammatus Clouds?

Submitted by Carolyn Willis
Observing Program Leader

http://www.crh.noaa.gov/lot/photos/Jul2004_mammatus/july13.php

Mammatus are pouch-like cloud structures and a rare example of clouds in sinking air. (Most clouds form in rising air.) Although mammatus most frequently form on the underside of a cumulonimbus, they can develop underneath cirrocumulus, altostratus, altocumulus, and stratocumulus. For a mammatus to form, the sinking air must be cooler than the air around it and have high liquid water or ice content. They derive their name from their appearance. The baglike sacs that hang beneath the cloud resemble “mamma” cows’ udders.

Winter 2010-2011 In Review

Submitted by Joe Lester
Meteorologist

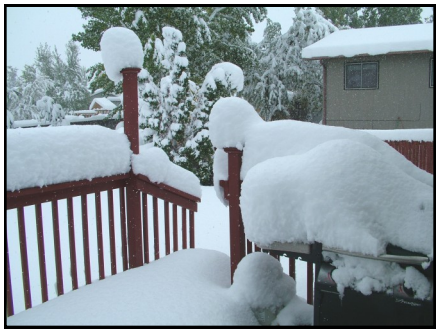
As the 2010-2011 winter comes to a close, let's take a look at how it compared to previous years. For many people it seemed to be a cold and snowy winter, perhaps one of the most extreme in recent memory, and the talk around the area reflects this sentiment. However, was it really the snowiest ever, or the coldest, or merely normal?

The fall of 2010 was warm and dry, with above normal temperatures and below normal precipitation from October through mid November. Things finally changed on November 18th, the date on which Billings actually received its first snowfall (which was much later than normal.) A shift in the weather pattern brought a remarkably cold and snowy period for the latter third of November, with some of the coldest pre-December temperatures seen since 1985. Much of the snow cover that established itself in late November stayed on the ground for most of the winter.

Meteorological winter is defined as the period from December through February, or what can be considered as the typical "winter months." During this 3-month period, temperatures at Billings averaged 23.6 degrees Fahrenheit, which was the 21st coldest since records began in 1934. Temperatures at Miles City averaged 15.4 degrees, which was the 16th coldest on record. Interestingly, temperatures at Billings and Miles City were colder from December through February of 2009-2010 than the current winter. So although this winter was colder than normal, it was certainly not record-breaking.

Total snowfall at Billings this winter stood at 61.2 inches as of March 30th. If no more snow occurs, which isn't likely, this would rank slightly above normal. Average snowfall after April 1st is 9.4 inches, so more snow is likely, but without one or two major snow storms we will not come near our record season. The record season occurred in 1996-1997 with a snowfall of 98.7 inches. Seasonal snowfall numbers may be a bit misleading though. All of the snowfall in Billings this season occurred between November 18th and March 6th, making this particular period the 2nd snowiest on record. Furthermore, record snowfall has occurred in northeast Montana. As of April 4, Glasgow had reported just over 105 inches of snow for the season, a truly remarkable feat. The abundant snowfall, which has remained over much of the winter across east and northeast Montana, has led to some flooding problems in these areas with the onset of warmer weather this March.

So why did this winter seem so extreme? A few reasons come to mind. First, once the snow fell around Thanksgiving it stayed on the ground for a good portion of the winter. Roads became snowy and rutty, and remained that way for extended periods of time.



Decks around the area looked like this many times this past winter. Photo by Carolyn Willis

Second, we did not experience any significant warm-ups during the winter months, which typically melt off at least some of the snow cover even during the middle of winter.

Third, our wintry weather was packed into a 3 ½ month period from late November to early March. So overall, even though the temperature and snowfall statistics in our area were not close to record-breaking, it was certainly a very challenging winter, which we haven't seen the likes of in several years.

Answers to Weather Spotter Word Search, on page 9

Montana Snow Water Equivalent Update Graph

Graph current as of April 4, 2011

Basin	Snow Water Equivalent Percent of Average
KOOTENAI RIVER BASIN	129%
FLATHEAD RIVER BASIN	138%
UPPER CLARK FORK RIVER BASIN	117%
BITTERROOT RIVER BASIN	109%
LOWER CLARK FORK RIVER BASIN	123%
JEFFERSON RIVER BASIN	108%
MADISON RIVER BASIN	112%
GALLATIN RIVER BASIN	117%
MISSOURI HEADWATERS	112%
HEADWATERS MISSOURI MAINSTEM	112%
SMITH, JUDITH, AND MUSSELSHELL RIVER BASINS	119%
SUN, TETON AND MARIAS RIVER BASINS	124%
MISSOURI MAINSTEM RIVER BASIN	121%
ST MARY AND MILK RIVER BASINS	133%
UPPER YELLOWSTONE RIVER BASIN	118%
WIND RIVER BASIN (WYOMING)	102%
SHOSHONE RIVER BASIN (WYOMING)	111%
BIGHORN RIVER BASIN (WYOMING)	112%
TONGUE RIVER BASIN (WYOMING)	106%
POWDER RIVER BASIN (WYOMING)	115%
LOWER YELLOWSTONE RIVER BASIN	108%

Legend:	<70%	70-90%	91-110%	111-130%	>130%

Snowpack Above Normal

Submitted by: Thomas Humphrey
Lead Forecaster
http://www.wcc.nrcs.usda.gov/cgibin/snowup-graph.pl?state=MT

The eastern plains of Montana have already experienced spring flooding due to ice jams and snow melt. Attention will soon turn to the mountains and the potential for high water later this spring. The mountains do have more snowpack compared to last year at this time. The mountains are sitting at around 110% of normal on average...which is well above the 75% of normal that the high country had last year at this time. There is still some winter left in the high county with a month of potential snowfall remaining. Last year was a prime example of how things can turn around. A flood season was not anticipated last year...but late spring snows proved enough to replenish the large deficits in snow pack and allowed some rivers to actually experience minor flooding. A great deal of potential flooding can also depend on timing and extent of late spring rain events. So...the mountains are in good shape for snow pack at this stage...but that does not necessarily guarantee a flood season for those river basins. Stay tuned!

Stock photo

Jet Stream Jargon
National Weather Service
2170 Overland Avenue
Billings, MT 59102

RETURN SERVICE
REQUESTED

Keep this list handy to remind you what is needed from your severe weather reports.

What to Report

- **Tornadoes, funnel clouds, rotation** in the clouds
- **Strong winds or wind damage** (structural damage, tree damage, power lines down, etc.)
- **Largest hailstone** size
- **Heavy rainfall** or **flooding**
- **Snow accumulations** and poor travel conditions

Call the toll-free spotter number, or 406-652-3109. Give us the following:

- **Who** you are
- **What** you saw
- **Where** you saw it (location from town, landmark, highway)
- **When** did it occur?
- Also relay any damage or injuries that may have occurred

Thank you for your severe weather reports!