

# Jet Stream Jargon

## Jet Stream Jargon

April 2009  
Spring/Summer Issue

### Inside this Issue

- 2 Coop Awards  
Staff Changes  
BLIZZARD!
- 3 Weather Word Search  
**eSpotter**  
Spotter & CoCo Reports
- 4 BLIZZARD #2!
- 5 Winter Review  
Spring Normals
- 6 Frost & Freeze Dates  
Summer Normals  
Severe Weather Words
- 7 Fischer Porter  
Precipitation Gauges  
Going Digital
- 8 Weather Story!

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

## Experimental Criterion Change for Hail Size in Severe Thunderstorms

*Submitted by: Tom Frieders,  
Warning Coordination Meteorologist*

The National Weather Service Offices across much of the central and western portions of the United States, including Montana and Wyoming, will begin using a new experimental hail size threshold for determining when to issue severe thunderstorm warnings. Until this spring, severe thunderstorm warnings were issued whenever hail of  $\frac{3}{4}$  of an inch in diameter or larger was observed or forecast to occur. Beginning this spring, severe thunderstorm warnings will only be issued for hail that is observed or forecast to be one inch in diameter or larger. This is an effort to better represent hail which produces damage and to reduce the complacency to numerous severe thunderstorm warnings that were issued for  $\frac{3}{4}$  inch diameter hail.

This effort is an expansion of a successful experiment conducted in Kansas over the past four severe weather seasons where the one inch hail size criterion was used. Due to the overwhelming positive response to this change in Kansas, this change has been expanded to include much of the central and western portions of the country for the 2009 season.

Severe thunderstorm warnings are also issued when winds are expected to be 58 mph or greater. This criterion is not changing. The National Weather Service continues to encourage observers and spotters to report any size hail and/or strong winds associated with thunderstorms. This assists our forecasters in the warning process. ♦

## Spotter Training Dates

*Taken from:*

[http://www.wrh.noaa.gov/byz/local\\_news/2009/spotter09.php](http://www.wrh.noaa.gov/byz/local_news/2009/spotter09.php)

- Thursday May 7<sup>th</sup>  
Hysham, MT 7-9pm  
Community Center
- Wednesday May 13<sup>th</sup>  
Broadus, MT 6-8pm  
Courthouse Election Room
- Wednesday May 13<sup>th</sup>  
Baker, MT 6-8pm  
Senior Citizens Center
- Thursday May 14<sup>th</sup>  
Sheridan, WY 6-8pm  
New Courthouse Mtg Rm
- Monday June 1<sup>st</sup>  
Ekalaka, MT 6-8pm  
New Fair Building

Attend a 2009 NWS Billings Spotter Training Session for a chance to win a rain gauge.

For more details on any spotter training session, please call (406) 652-0851. ♦



# Spring/Summer Weather Word Search

Submitted by: *Brianne Vogt, Hydrometeorological Technician*

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

COLD FRONT                      SPRING  
CUMULONIMBUS                  SQUALL  
DROUGHT                          SUMMER  
FLASH FLOOD                      SUN  
FUJITA SCALE                      SUPERCELL  
HAIL                                  THUNDERSTORM  
HEAT                                  TORNADO  
HUMIDITY                          UNSTABLE  
JET STREAM                        WALL CLOUD  
LIGHTNING                        WARNING  
MICROBURST                        WATCH  
RADAR                                WET  
RAINBOW                            WILDFIRES

## eSpotter Comes to the Billings Forecast Office

Submitted by: *Matt Solum, General Forecaster*

The Billings National Weather Service will start using a new online weather reporting system called **eSpotter** this spring. **eSpotter** is a system to facilitate the submission of spotter reports online. The system is designed to enhance and increase, timely, accurate online spotter reporting, as well as communications between spotters and local weather forecast offices. More information about **eSpotter** can be found by visiting <http://espotter.weather.gov/>.

You may also contact Tom Frieders, Warning Coordination Meteorologist, at (406) 652-0851 or via email at [tom.frieders@noaa.gov](mailto:tom.frieders@noaa.gov) . ♦

## Wanted: Spotter & CoCoRaHS Reports

Submitted by: *Matt Solum, General Forecaster*

The National Weather Service relies on spotter and CoCoRaHS reports to supplement Doppler radar information and automated station reports everyday of the year. These reports become even more crucial during inclement weather during the warning process to help forecasters in the decision making process as well as verify the validity of warnings after events. The reports are also used in research and to help improve service in the future. The next time you get hail, strong winds, heavy rain or accumulating snow, let us know! Remember, we're available 24 hours a day. Your report may help save a life! ♦

## Important Dates

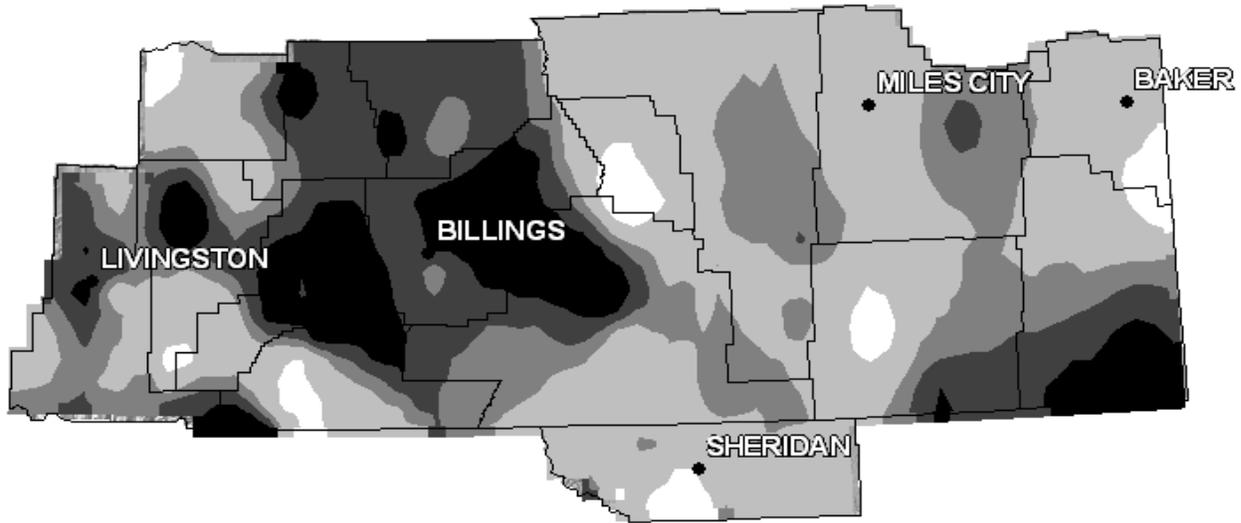
Spring began: March 20<sup>th</sup>, 2009 at 5:44am  
First day of Summer: June 20<sup>th</sup>, 2009 at 11:45pm  
First day of Fall: September 22<sup>nd</sup>, 2009 at 3:18pm

## Time Change Information

Time reverts to *standard time* at 2 a.m. the first Sunday of November; which will be November 1<sup>st</sup>, 2009.



# Snow March 29-30



Snow in Inches  0.8 - 4  4.1 - 6  6.1 - 8  8.1 - 12  12.1 - 18

## ❄️ **BLIZZARD #2! Selected Storm Reports** ❄️

Map by: *Brianne Vogt, Hydrometeorological Technician* ❄️ Storm reports: *Cooperative Observers, Spotters & automated sites*

### ❄️ **Fallon County**

Webster 6.9ESE 18.0 inches  
Baker 0.5S 9.0 inches

### ❄️ **Carter County**

Ekalaka 0.2ENE 12.0 inches  
Capitol 2.6NNW 6.0 inches  
Alzada 0.7S 3.0 inches

### ❄️ **Powder River County**

Sonnette 1.8W 14.0 inches  
Broadus 16.3NW 8.1 inches

### ❄️ **Wheatland County**

Judith Gap 11.8W 9.0 inches

### ❄️ **Rosebud County**

Ashland 0.4SE 12.0 inches  
Colstrip 6.3S 8.0 inches

### ❄️ **Golden Valley County**

Lavina 4.4W 7.0 inches

### ❄️ **Treasure County**

Big Horn 9.2SSE 18.0 inches  
Hysham 7.8SE 10.0 inches

### ❄️ **Sweet Grass County**

Placer Basin Snotel 18.0 inches  
Melville 13.2ENE 12.0 inches  
Big Timber 2.0 inches

### ❄️ **Stillwater County**

Fishtail 18.1SW 22.0 inches  
Nye 0.7SE 12.0 inches  
Columbus 5.0 inches

### ❄️ **Yellowstone County**

Billings (Briarwood) 8.0 inches  
Pompeys Pillar 4.5 inches  
Huntley 3.6ENE 2.0 inches

### ❄️ **Custer County**

Miles City 12.0 inches  
Volborg 31.2E 7.0 inches

### ❄️ **Sheridan Co. Wyoming**

Story 0.9W 16.0 inches  
Sheridan 1.4NW 11.8 inches  
Banner 3.4ENE 7.5 inches

### ❄️ **Big Horn County**

Lodge Grass 12.0 inches  
Decker 10.1NNE 6.0 inches

### ❄️ **Park County**

Fisher Crk Snotel 21.0 inches  
Livingston 10.0 inches  
Wilsall 0.3NNW 6.5 inches

### ❄️ **Musselshell County**

Roundup 11.4N 10.0 inches  
Roundup 5.0 inches

### ❄️ **Carbon County**

Cole Crk Snotel 21.0 inches  
Red Lodge 12.0 inches  
Bridger 6.1W 6.0 inches

# Winter Review

Submitted by: Matt Solum, General Forecaster

The winter season officially ended Friday, March 20<sup>th</sup>, 2009 at 5:44am. The following tables summarize temperature and precipitation statistics for the Billings Airport, the Miles City Airport, and the Sheridan County Wyoming Airport. Normals are based upon 30 years of data calculated from 1971 to 2000. Temperatures are in degrees Fahrenheit and precipitation amounts are in inches.

Billings										
Date	Norm Hi	08-09 Ave Hi	Norm Lo	08-09 Ave Lo	Norm Ave	08-09 Ave	Norm Precip.	08-09 Precip.	Norm Snowfall	08-09 Snowfall
12/21 – 12/31	33.1	26.9	15.3	11.1	24.2	19.0	0.21	0.51	3.3	7.6
1/1 – 1/31	32.8	39.2	15.1	20.1	24.0	29.7	0.81	0.43	10.9	9.1
2/1 – 2/28	39.3	43.4	20.0	24.0	29.6	33.7	0.58	0.37	6.5	10.1
3/1 – 3/20	46.1	44.5	25.3	21.2	35.7	32.8	0.69	0.66	6.8	8.0
12/21 – 3/20	38.0	40.2	18.9	20.5	28.5	30.3	2.29	1.97	27.6	34.8

Miles City*									
Date	Norm Hi	08-09 Ave Hi	Norm Lo	08-09 Ave Lo	Norm Ave	08-09 Ave	Norm Precip.	08-09 Precip.	
12/21 – 12/31	27.8	21.6	8.4	0.1	18.1	10.9	0.20	0.03	
1/1 – 1/31	27.3	30.4	7.4	10.3	17.4	20.3	0.50	0.10	
2/1 – 2/28	35.2	36.5	14.4	18.3	24.8	27.4	0.34	0.04	
3/1 – 3/20	44.0	43.3	21.8	18.2	32.9	30.7	0.30	0.11	
12/21 – 3/20	33.8	34.1	13.1	13.3	23.4	23.7	1.28	0.28	
Sheridan*									
12/21 – 12/31	33.2	27.3	9.7	2.5	21.5	14.9	0.19	0.26	
1/1 – 1/31	33.0	37.8	9.7	14.0	21.3	25.9	0.77	1.10	
2/1 – 2/28	38.9	42.6	14.9	18.8	26.9	30.7	0.56	0.14	
3/1 – 3/20	46.5	47.5	21.7	17.0	34.1	32.2	0.57	0.34	
12/21 – 3/20	38.1	40.2	14.0	14.7	26.1	27.5	2.05	1.84	

\*This station is automated and may underestimate winter precipitation. Snowfall is not reported.

# Spring Normals

Submitted by: Matt Solum, General Forecaster

Spring officially arrived Friday, March 20<sup>th</sup>, 2009 at 5:44am and will end Saturday, June 20<sup>th</sup>. The following tables represent average temperature and precipitation for the Billings Airport, the Miles City Airport, and the Sheridan County Wyoming Airport for the spring season. Averages are based upon 30 years of data calculated from 1971 to 2000. Temperatures are in degrees Fahrenheit and precipitation amounts are in inches. Snowfall measurements are not recorded at Miles City or Sheridan, Wyoming.

Miles City*				
Date	Hi	Lo	Ave	Precip.
3/20 – 3/31	50.1	27.0	38.5	0.29
4/1 – 4/30	58.8	34.5	46.7	1.40
5/1 – 5/31	69.5	44.9	57.2	2.19
6/1 – 6/20	78.0	53.1	65.5	1.70
3/20 – 6/20	65.4	41.0	53.2	5.57
Sheridan*				
Date	Hi	Lo	Ave	Precip.
3/20 – 3/31	50.3	24.5	37.4	0.45
4/1 – 4/30	57.5	30.4	43.9	1.77
5/1 – 5/31	66.4	38.6	52.5	2.41
6/1 – 6/20	75.0	46.5	60.8	1.67
3/20 – 6/20	63.4	36.2	49.8	6.31

\*This station does not report snowfall.

Billings					
Date	Hi	Lo	Ave	Precip.	Snowfall
3/20 – 3/31	49.8	28.3	39.1	0.44	3.6
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
6/1 – 6/20	75.8	50.7	63.3	1.46	T
3/20 – 6/20	63.7	40.2	51.9	6.13	13.3

## Frost & Freeze Dates

Submitted by: Matt Solum, General Forecaster

Many people will soon plant gardens across the region. One important thing to keep in mind is the average frost and freeze dates in order to protect plants. The following tables are the frost and freeze dates for the Billings Airport, the Miles City Airport and the Sheridan County Wyoming Airport. The freezing temperature is based upon 32 degrees Fahrenheit and the frost temperature is based upon 36 degrees Fahrenheit. The average dates are based upon 30 years of data calculated from 1971 to 2000. The latest freeze and frost dates are based on a period of record. Records began for the Billings Airport in 1934, the Miles City Airport in 1937 and the Sheridan County Wyoming Airport in 1934.

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

Gardening brochures are available online at: [http://www.wrh.noaa.gov/byz/climate/garden\\_billings.pdf](http://www.wrh.noaa.gov/byz/climate/garden_billings.pdf) (Miles City/Sheridan also online).



## Summer Normals

Submitted by: Matt Solum, General Forecaster

Summer officially arrives Saturday, June 20<sup>th</sup>, 2009 at 11:45pm and will end Tuesday, September 22<sup>nd</sup>. Average temperature and precipitation for the Billings Airport, the Miles City Airport, and the Sheridan County Wyoming Airport are shown in the following tables. Averages are based upon 30 years of data calculated from 1971 to 2000. Temperatures are in degrees Fahrenheit and precipitation amounts are in inches.

Billings				
Date	Hi	Lo	Ave	Precip.
6/20 – 6/30	82.0	54.3	68.1	0.46
7/1 – 7/31	85.8	58.3	72.0	1.28
8/1 – 8/31	84.5	57.3	70.9	0.85
9/1 – 9/22	74.0	48.0	61.0	1.10
6/20 – 9/22	82.4	54.8	68.6	3.69
Miles City				
Date	Hi	Lo	Ave	Precip.
6/20 – 6/30	83.4	56.5	70.0	0.78
7/1 – 7/31	87.9	60.2	74.1	1.61
8/1 – 8/31	86.8	58.9	72.9	1.16
9/1 – 9/22	75.5	48.5	62.0	0.94
6/20 – 9/22	84.1	56.6	70.4	4.49
Sheridan				
Date	Hi	Lo	Ave	Precip.
6/20 – 6/30	81.2	49.4	65.3	0.42
7/1 – 7/31	85.2	52.4	68.8	1.11
8/1 – 8/31	84.9	51.5	68.2	0.80
9/1 – 9/22	75.5	43.7	59.6	1.07
6/20 – 9/22	82.9	50.2	66.5	3.41

## Severe Weather Definitions

Submitted by: Kurt Hooley, General Forecaster

**Severe Thunderstorm Watch:** Conditions are favorable for thunderstorms to produce wind gusts to 58 mph or stronger and/or hail to one inch in diameter or larger in the watch area. These watches are issued for 4 to 6 hours at a time and for a number of counties.

**Severe Thunderstorm Warning:** A severe thunderstorm has been detected by radar, or by a trained spotter.

**Tornado Watch:** Conditions are favorable for tornadoes to develop. It is normally issued for 4 to 6 hours, and may include several counties.

**Tornado Warning:** A tornado has been sighted, or a developing tornado is reported by trained spotters or indicated on Doppler radar. A warning is typically issued for a small area for less than an hour.

Continued on page 7...**Definitions**

# Fischer Porter Precipitation Gages Going Digital

Submitted by: Carolyn Willis,  
Cooperative Program Manager

There are over 2200 Fischer Porter Recording Precipitation Gages in the United States, and 16 are located within the NWS Billings area of responsibility in Montana and Wyoming. Over 90% of the repairs performed on Fischer Porter gauges in the past five years have had to do with the punch mechanism and paper tape. The tape jams, the pins bend and rip the tape, the tape alignment slips, the paper take-up reel spring breaks, or the motor or micro-switch burns out and it stops punching altogether. The wear and tear on the punch mechanism after years of punching every 15 minutes takes its toll. I was very glad to hear of the new planned conversion of these gages over the next few years to a digital recording system (see photo below).



[http://www.sutron.com/pdfs/2007\\_FP\\_Precip\\_Ga ge\\_Upgrade.pdf](http://www.sutron.com/pdfs/2007_FP_Precip_Ga ge_Upgrade.pdf)

Instead of dealing with a paper tape each month, the observer will remove an SD memory card; the same kinds used by digital cameras, and mail it to the NWS. Another SD memory card will be provided by the National Weather Service and inserted into the digital reader for the following month's data. A built in clock will keep readings accurately timed, and the front panel of the unit will allow the NWS representative to calibrate the gauge easily. The outside of the unit will remain unchanged. For those of you who write down the

precipitation amounts by trying to read the holes punched in the tape, you will be glad to know that the actual amount of precipitation received will be displayed on the LED screen and will reset when the card is changed.

I will be attending a Cooperative Program class in Kansas City for two weeks in May. One of the items on the class schedule will be learning how to install these new upgrade kits. As soon as they arrive in the field, I'll be able to get them installed on the Fischer Porter Gauges.

**Just a reminder:** It's that time of year to once again put the inner tube into your 8" rain gauge, and cap it with the funnel. The funnel helps keep hail from splashing the water out of the gauge during a downpour. ♦

## Definitions...Continued from page 6...

**Flash Flood Watch:** Issued when heavy rain may develop and result in flash flooding in or near the watch area.

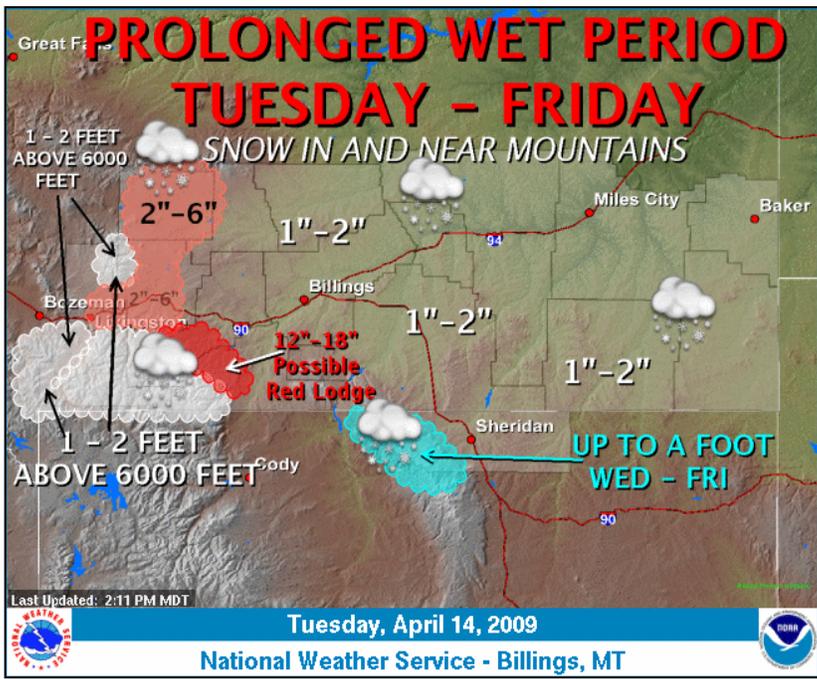
**Flash Flood Warning:** Flash flooding in the warning area has developed or is imminent.

**Small Stream Flood Advisory:** Alerts the public to flooding which is an inconvenience to those living in the affected area. It is issued when heavy rain will cause flooding of streets and low-lying places in city areas or if small rural or urban streams are expected to reach or exceed bank full.

**Hazardous Weather Outlook:** This product is issued to discuss the potential for significant weather and is intended for spotters and Emergency Managers. It contains details of the type of severe weather anticipated, timing and expected location of the severe weather. ♦

NOAA's National Weather Service  
Serving the Nation Since 1870

<http://weather.gov/>  
<http://weather.gov/billings>



## Introducing: Weather Story!

Graphics and bold text taken from:  
<http://www.wrh.noaa.gov/FXC/wxstory.php?wfo=byz>

Graphics or pictorial weather stories, like this pictured at left, are now being created on a daily basis and posted to the Billings NWS web site. In addition to these graphics, a written summary will be found below the Weather Story giving additional details for the next 24 hours or beyond depending on the impacts to the region (example text below). The graphic can be accessed by clicking on "Weather Story" at the top of the NWS web page or by typing in the above URL. Please take the time to view the graphic and let us know what you think. Remember, it changes daily!

**A SLOW MOVING...WET...SPRING STORM WILL AFFECT THE AREA FOR MOST OF THE WEEK. SNOW WILL BE HEAVY IN THE MOUNTAINS. THERE WILL BE ACCUMULATIONS OF 2 TO 6 INCHES NEAR THE MOUNTAINS...FROM JUDITH GAP SOUTH INTO THE LIVINGSTON AREA. SNOW ACCUMULATIONS OF UP TO A FOOT WILL BE POSSIBLE IN THE RED LODGE AREA. LOWER ELEVATIONS WILL SEE A RAIN AND SNOW MIX...TURNING TO ALL SNOW TONIGHT THROUGH FRIDAY. ACCUMULATIONS OF UP TO 2 INCHES WILL BE POSSIBLE AT LOWER ELEVATIONS. ♠**

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

PRSRRT STD  
 US POSTAGE  
 PAID  
 Billings MT  
 PERMIT NO. G19

RETURN SERVICE  
 REQUESTED