



Jet Stream Jargon

**National Weather Service
Billings, MT**

October 2018 Fall Issue



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From the Desk of the Meteorologist in Charge

Reflecting back on the Spring and Summer, the snowmelt runoff season was particularly interesting. Despite the record snowpack in a number of basins, our area fared well in regards to severe flooding impacts. We had high flows in many areas for a large portion of May and into early June, but the timing, location and amounts of the Spring rains generally were favorable in easing the potential threat of more significant flooding.

Our staff will be reviewing the 2018 runoff season to assess our services and make any necessary adjustments in preparation for next year's snowmelt runoff.

For the first time in a number of years, I can state that our office is fully staffed. We recently promoted General Forecaster Ryan Walsh into the Science & Operations Officer position and quickly transitioned Bob Setzenfand from his PhD student status into the open General Forecaster position. Additionally, we brought in two (2) new Meteorologists: Nick Vertz (from Wisconsin) and Krista Carrothers (from Spokane). Lastly, we are happy to welcome a new Administrative Support Assistant, Linda Brennan from the Bureau of Reclamation. This position has been vacant for over two years.

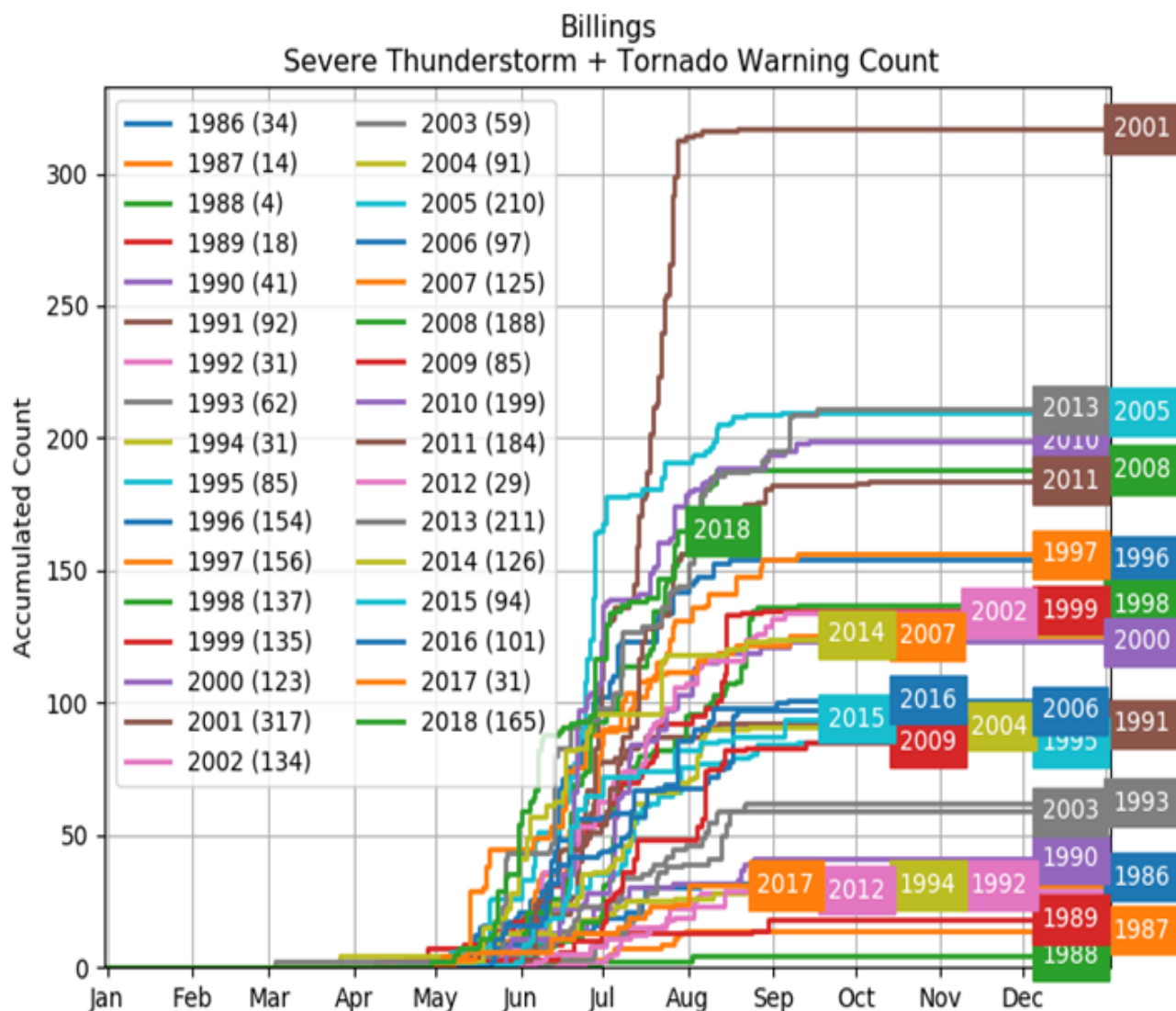
Thanks again for all the reports you provide as weather spotters and Coop Observers.



Keith W. Meier



As the image below indicates, the 2018 Severe Weather season has been the most active in our area since 2013, with the number of Severe Weather Warnings being on par with 2005, 2008, 2010, 2011 and 2013 (five of our top 6 years – not sure we’ll ever see another 2001).



Generated at 1 Aug 2018 12:47 PM CDT in 0.58s

IEM Autoplot App #44



On May 21, 2018, Western Region Director Dr. Grant Cooper joined Billings Meteorologist In Charge, Keith Meier and Observing Program Leader, Larry Dooley to present several Cooperative Observer Awards to observers in southeast Montana.



Pictured from left to right: Dr. Grant Cooper (NWS Western Regional Director), Dick Brewer (Coop Observer), Keith Meier (NWS Billings Meteorologist in Charge).

Dick Brewer of Brandenburg, Montana was named as the 2017 recipient of the agency's prestigious John Campanius Holm Award for outstanding service in the Cooperative Weather Observing Program.

While the Brandenburg Cooperative Observer Station was first established in 1956, Mr. Brewer began reporting daily observations on his ranch in Brandenburg in December 1982. Mr. Brewer has provided timely, accurate and dependable weather data for 35 years.

Clint Dietz of Plevna, Montana was also named as the 2017 recipient of the agency's prestigious John Campanius Holm Award for outstanding service in the Cooperative Weather Observing Program. While the Plevna Cooperative Observer Station was established in 1912, Mr. Dietz began taking observations from the Plevna, Montana Farmers Grain Elevator in November 1982. Clint's weather records play a major role in defining the climate of Plevna, Montana and the surrounding area, including the city of Baker. The region has experienced a variety of weather in his 36 years.



Pictured from left to right: Dr. Grant Cooper (NWS Western Regional Director), Clint Dietz (Coop Observer), Keith Meier (NWS Billings Meteorologist in Charge).



Pictured from left to right: Dr. Grant Cooper (NWS Western Regional Director), John Jonutis (Coop Observer), Keith Meier (NWS Billings Meteorologist in Charge).

John Jonutis of

Mizpah, Montana was the recipient of the Helmut E. Landsberg Award recognizing 60 years of service. Mr. Jonutis began taking observations in October 1958; providing timely, accurate and dependable weather data that has totaled nearly 22,000 observations during his 60 years of service to the nation! In this time, he recalls that the area has seen a variety of extreme weather, from a 3.38 inch downpour in August 1999 to a low annual precipitation of only 7.70 inches in 1979. The Mizpah station also recorded 10.24 inches of rainfall in May of 2011, which caused extreme flooding in the Mizpah area. A year ago, Mr. Jonutis tried to retire, but it just wasn't in his heart to discontinue reporting his

weather, and providing a great service! Thank you, John and welcome back!

Congratulations to all of our resilient & dedicated Observers!



Greetings all!

CoCoRaHS celebrated it's 20th year in July of this year! Happy Birthday! Another summer has come and gone! Time flies, and it won't be long before you will want to remove your funnels and tubes from your rain gauges to prepare for winter. Please leave your gauge out so that you can catch the snow and melt it for SWE. Remember, a great snowboard is just a 2 ft x 2 ft plywood board, painted white. If you are unfamiliar or uncomfortable with measuring snow in the winter, please refer to the CoCoRaHS website, <https://cocorahs.org> on the Home page. In the videos section under Resources, you will find the Snow Measuring video, along with many other helpful videos.

A newly named section has been added to the CoCoRaHS website. It is called Condition Monitoring, which was actually the old Drought Impact section. If you previously reported on drought at your station, this is a new way of reporting, however, your drought reports remain in CoCoRaHS database. Some of you, CoCoRaHS observers, may be interested in this program. If so, look for information on the home page and click the link under Resources on the home page to learn how to submit your station's Condition Report.



Remember that the CoCoRaHS website has a store where you can purchase many items of interest, including individual parts to your rain gauges. You can pick up replacement funnels and tubes, NOAA Weather Radios, even the famous "Snow Swatter", shown in many of the videos.

Thanks to all of you who tirelessly report your precipitation every day. CoCoRaHS, the National Weather Service, and countless other users are grateful for your dedication. Feel free to contact myself or Tom Frieders at the NWS office in Billings, if you have issues or concerns, at (406) 652-0851, or you can email us at: vickie.stephenson@noaa.gov or tom.frieders@noaa.gov

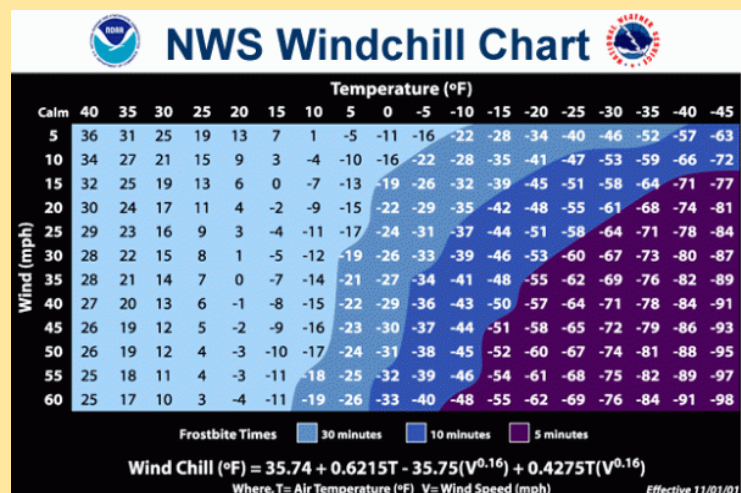
Have a fun, safe and happy holiday season!



Winds can be dangerous in cold temperatures Dress appropriately! Be Prepared!

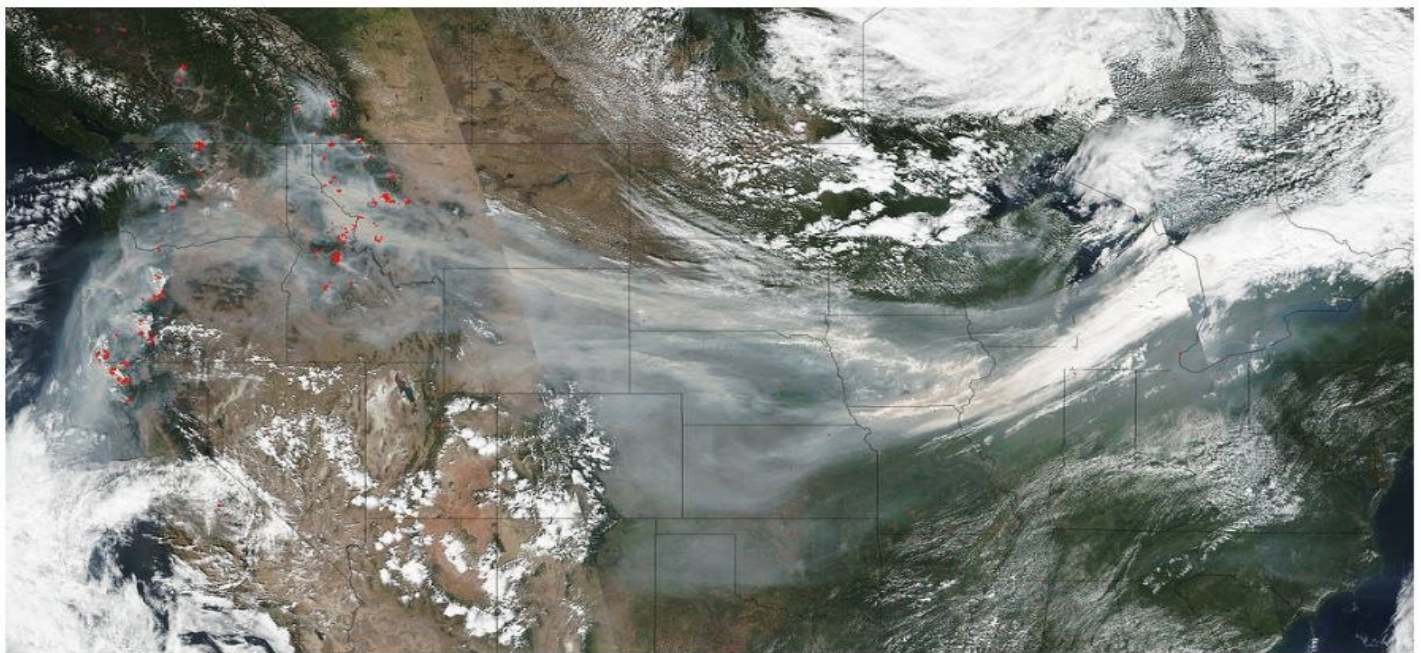
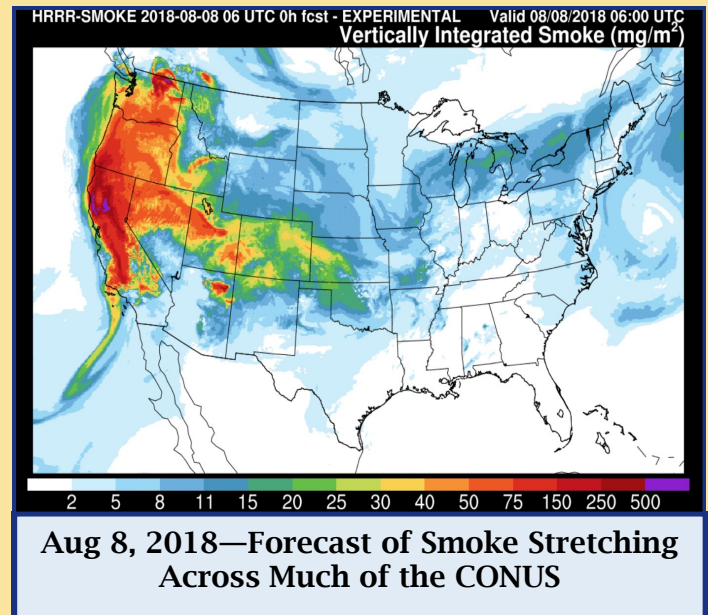


The best way to avoid hypothermia and frostbite is to stay warm and dry indoors and outdoors. When you must go outside, wear several layers of loose-fitting, light-weight, warm clothing. Trapped air between the layers will insulate you. Remove layers to avoid sweating and chill. Outer garments should be tightly woven, water repellent and hooded. Wear a hat because much of your body heat can be lost from your head. Cover your mouth to protect your lungs from extreme cold. Mittens, snug at the wrist, are better than gloves. Try to stay dry and out of the wind.



Smoke from Western Wildfires Impacts East Coast

While summer wildfires can bring persistent smoke to communities in Montana, Wyoming and other Western States, it is not uncommon for that smoke to impact other parts of the country. This is most likely to occur when a large number of fires have been burning for an extended period of time, creating a large pocket of smoke which gets swept across the continent when the jet stream undergoes a shift. Recent years have brought new satellites and computer models that allow the National Weather Service to track and forecast these impacts. While other natural disasters' impacts usually remain local, wildfire impacts can span halfway around the globe!



NASA's Suomi NPP satellite collected this natural-color image using the VIIRS (Visible Infrared Imaging Radiometer Suite) instrument on Sept. 4, 2017. Actively burning areas are outlined in red. NASA image courtesy Jeff Schmaltz LANCE/EOSDIS MODIS Rapid Response Team, GSFC



Renovations to Extend Life of National Weather Service Doppler Radar



Billings, MT Doppler Radar

The Billings, MT National Weather Service (NWS) radar has been in service since 1995, servicing over 270,000 people of south central Montana and northern Wyoming. This radar is part of a network of nearly 160 Doppler Radars operating across the country. Doppler Radar is a vital component of the forecast and warning operations for the protection of life and property; providing important information on precipitation and wind.

Just like any high tech equipment, this system requires preventative maintenance to keep it running smoothly. A series of four renovations are underway and expected to be completed by 2022 which will ultimately extend the life of the radar for another 20 years, into the 2040's, resulting in a more stable and accurate system! The first two phases for our local radar are complete; replacement of high failure items and old wiring with solid state electronics. The next two projects over the coming years will include the refurbishment of the pedestal and equipment shelters.

The National Weather Service continues to improve services and equipment to allow us to complete our mission of protecting life and property across the country.



Doppler Radar Pedestal Replacement



Doppler Radar Shelter - Protects sensitive equipment from the elements



A Recap of Meteorological Summer (June – August)

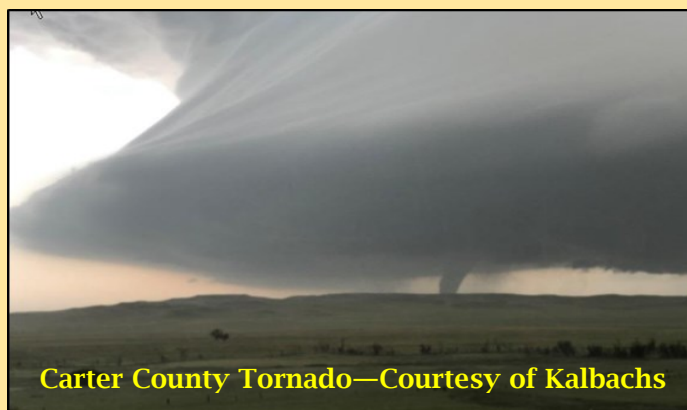
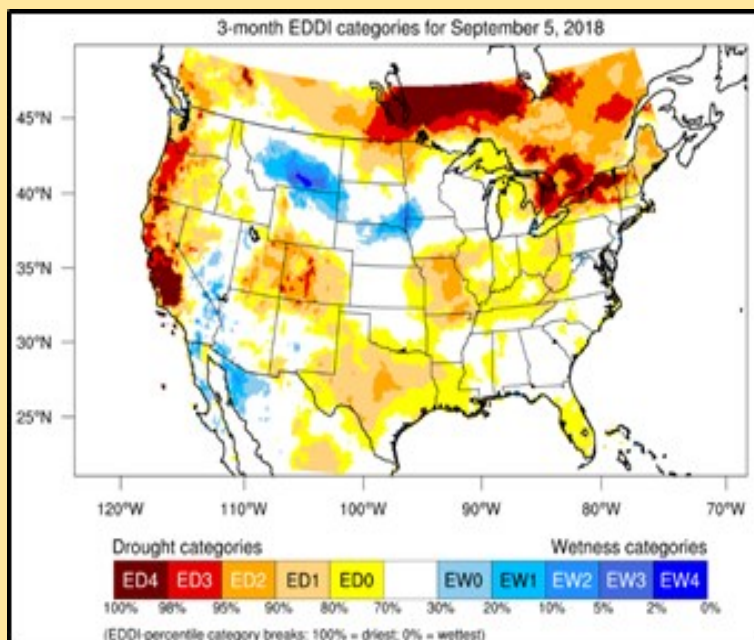
The summer of 2018, our region was wetter and slightly cooler than normal, with an above normal thunderstorm season and a quiet fire season.

Our office issued a total of 176 Severe Thunderstorm Warnings in 2018, which was more than in 2016 & 2017 combined, and the most in any season since 2013. A couple of the more memorable storms included one that produced up to tennis ball size hail and flash flooding in Roundup on May 31st, and a tornadic storm near Capitol (which also produced 70-80 mph straight line winds and golf ball size hail) on June 28th. Due to the above normal precipitation and prolonged greenness, our fire season was relatively quiet. The Bacon Rind Fire, south of Big Sky along Highway 191, started by lightning on July 20th, had burned 3700 acres as of September 8th.

Here is a summary of June – August statistics at our four main climate stations:

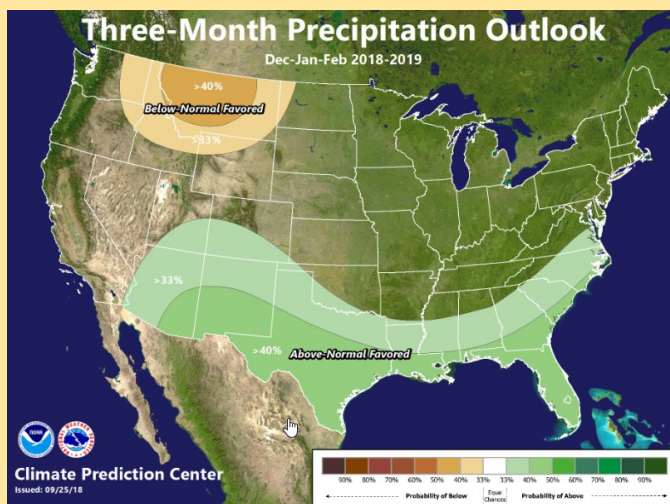
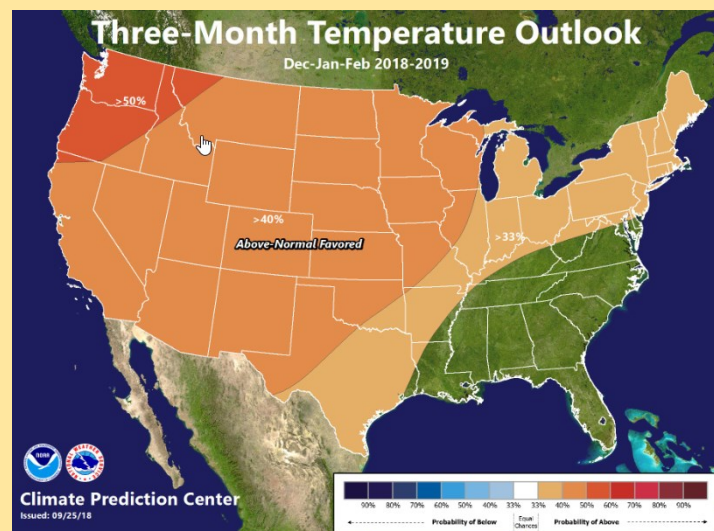
	Avg. Temp (°F)	Departure from Normal	Ranking	Total Precipitation (inches)	Departure from Normal	Ranking	Year Period of Record Began
Billings	68.7	- 1.0	27 th coolest	6.04	+ 1.85	17 th wettest	1934
Livingston	63.9	- 1.0	24 th coolest	6.04	+ 1.07	20 th wettest	1948
Miles City	70.2	- 1.3	24 th coolest	6.56	+ 1.50	21 st wettest	1937
Sheridan	67.0	- 0.4	54 th warmest	3.94	- 0.08	52 nd wettest	1907

Below is a 3-month assessment of the Evaporative Demand Drought Index (EDDI). This index shows our region highlighted with high “wetness” from early June to early September. Much drier conditions can be seen along the Pacific coast as well as Utah and Colorado, areas which were impacted by a large number of wildfires.



A weak to moderate El Nino episode is expected in the tropical Pacific Ocean during the upcoming fall and winter. El Nino favors warmer and drier conditions across the Pacific Northwest and northern Rockies, with a stronger jet stream and above normal storminess across the southern U.S. As a result, the latest outlooks from the Climate Prediction Center show an increased likelihood of warmer and drier than normal conditions across our region. However, all El Ninos are different, and our winters have trended wetter over the past two decades. Also, northeast upslope areas such as near Red Lodge (in the Beartooths) and Burgess Junction (Bighorn Mountains) average a bit more precipitation during El Nino. Whether or not it is a cold/snowy or warm/dry winter overall, our climatology on the eastern slopes of the mountains favors rapid shifts in weather – so be prepared for all extremes during the upcoming winter!

Here are the official December – January – February Temperature and Precipitation outlooks from the Climate Prediction Center, issued on September 25th, where above normal temperatures and below normal precipitation are favored for our area.

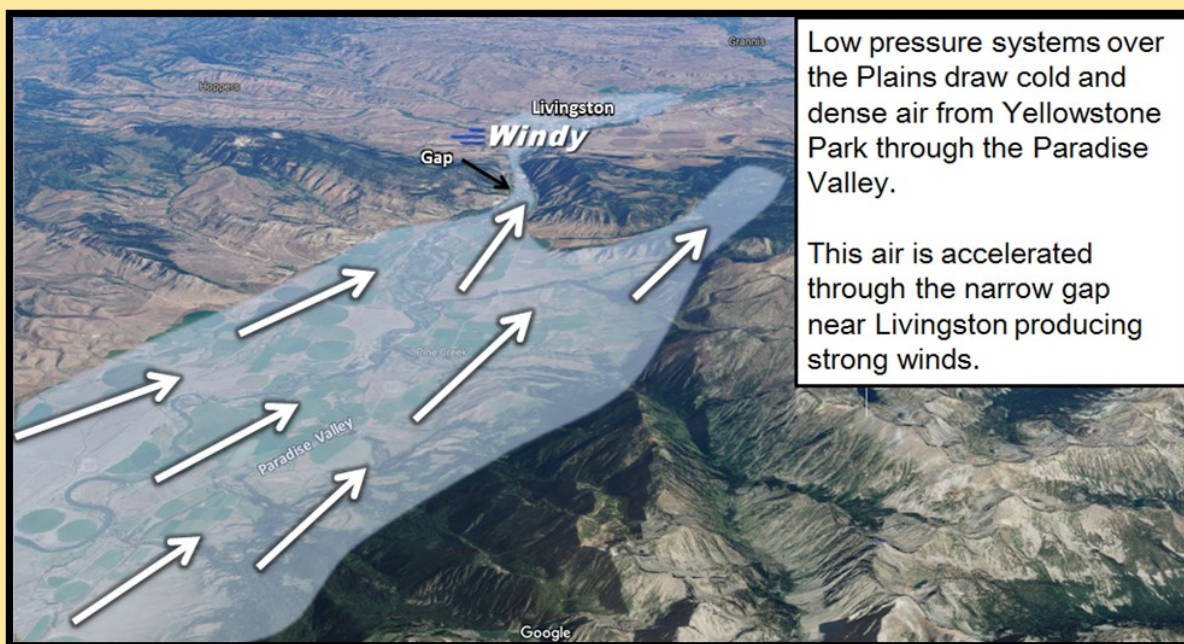


Livingston, Montana is one of the most unique places in our forecast area. Situated north of a narrow gap at the north end of the Paradise Valley, Livingston is susceptible to very strong winds during the cool season. Montana is known for being a windy place but Livingston takes that to a whole other level.

October 2017 – March 2018	Billings	Livingston
Days with gusts 40-49 mph	14	39
Days with gusts 50-59 mph	4	33
Days with gusts 60-69 mph	0	20
Days with gusts 70 mph +	0	7

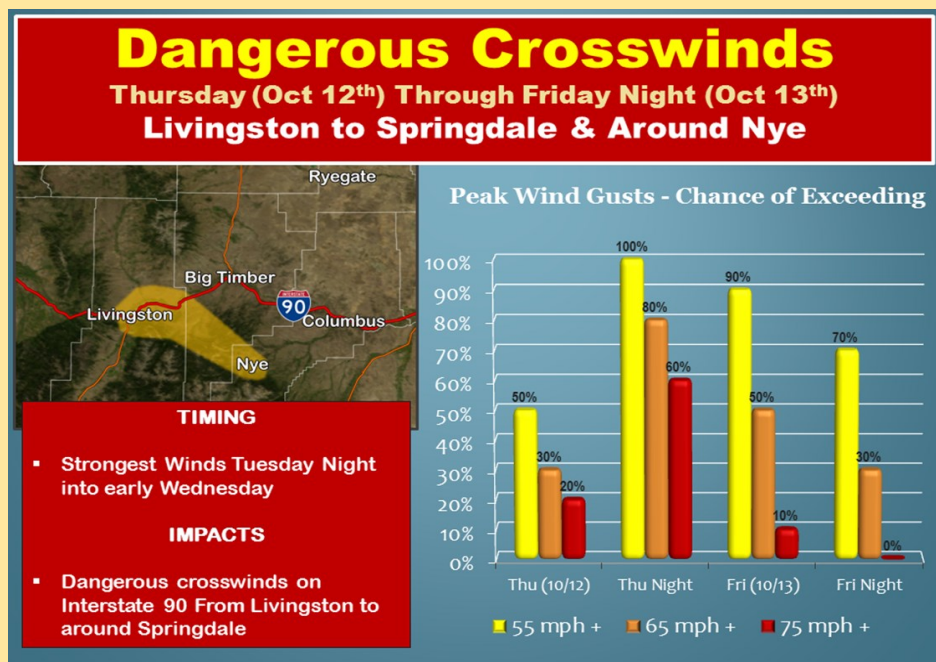
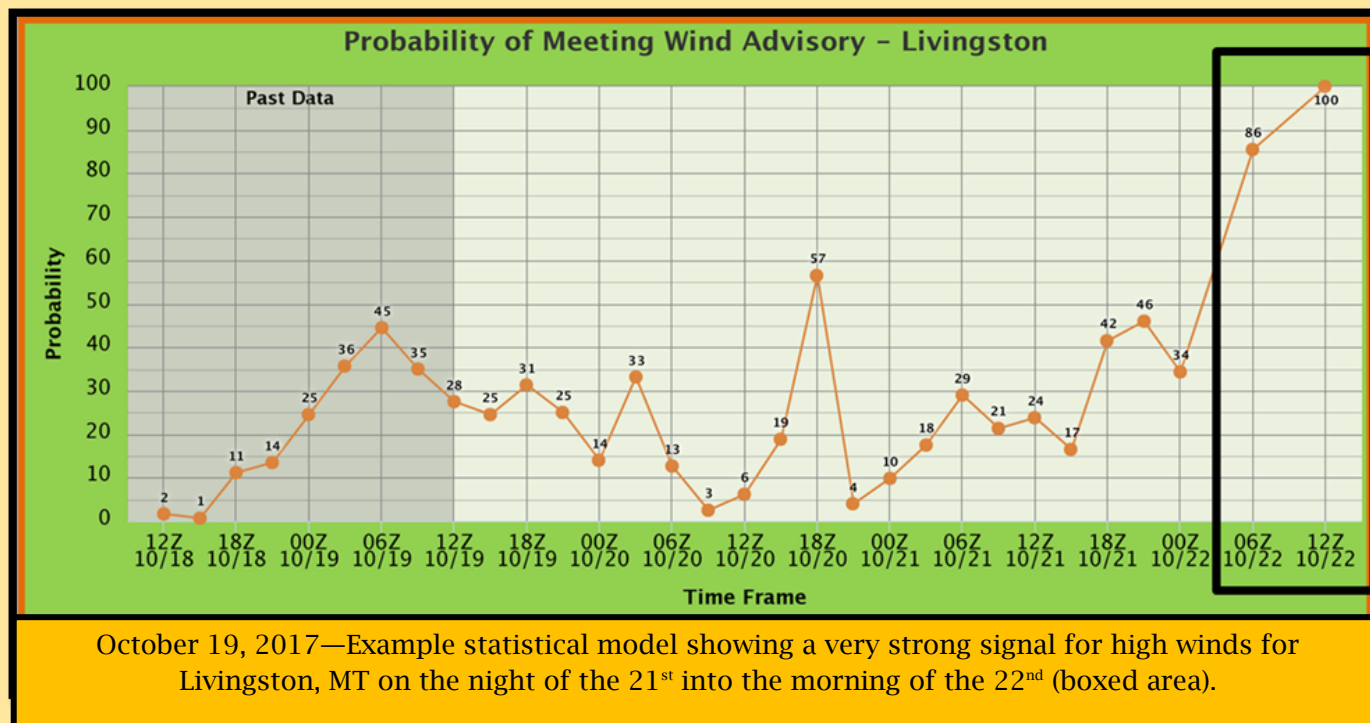
A comparison of wind gusts at Billings, MT vs. Livingston, MT

During the cool season, the high elevation plateau in Yellowstone National Park becomes a local maximum for cold air. Throughout the winter, numerous low pressure systems track from west to east across the northern Rockies. As they move into eastern Montana the lower pressure acts like a straw drawing air northward, out of the Park and into the Paradise Valley. That air is then drawn through a very narrow gap at the north end of the Paradise Valley and into Livingston. This narrowing causes the wind to accelerate through the gap. The acceleration of the wind through a narrow terrain opening is much like putting a spray nozzle on your garden hose. Forcing a large amount of liquid through the narrow hole of the nozzle is what accelerates the water, allowing it to exit the hose at larger speeds and spray further into the air.



The end result for Livingston is many days with very strong winds. These winds impact stretches of Interstate-90 causing dangerous crosswinds capable of tipping over vehicles. These winds can also cause ground blizzards, which is when snow that has previously fallen is blown through the air completely obscuring a driver's ability to see the road.

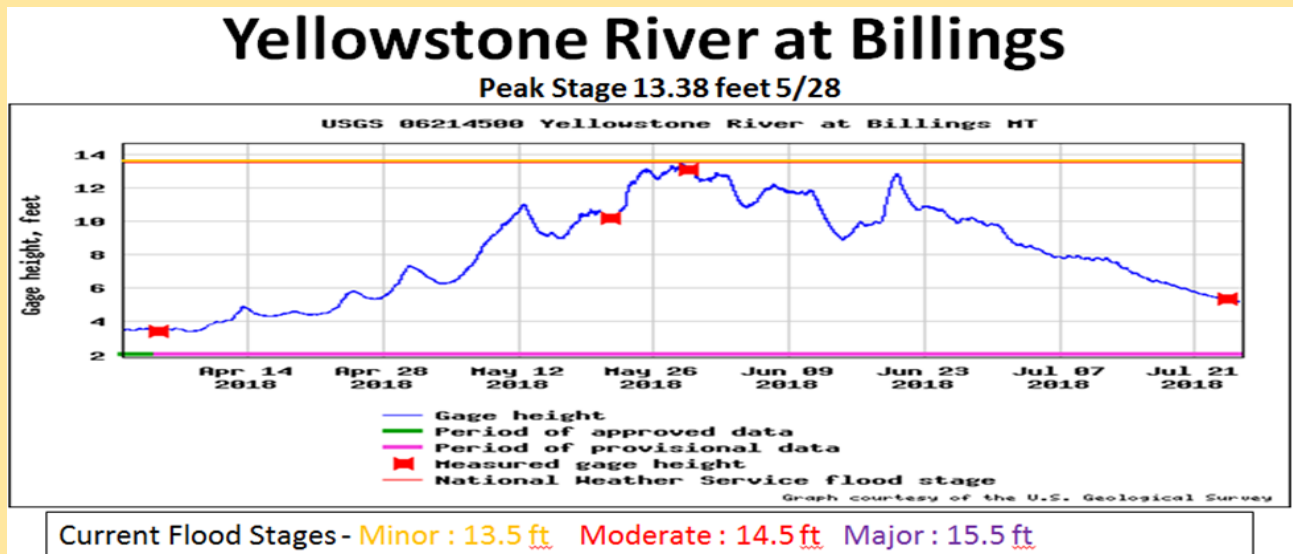
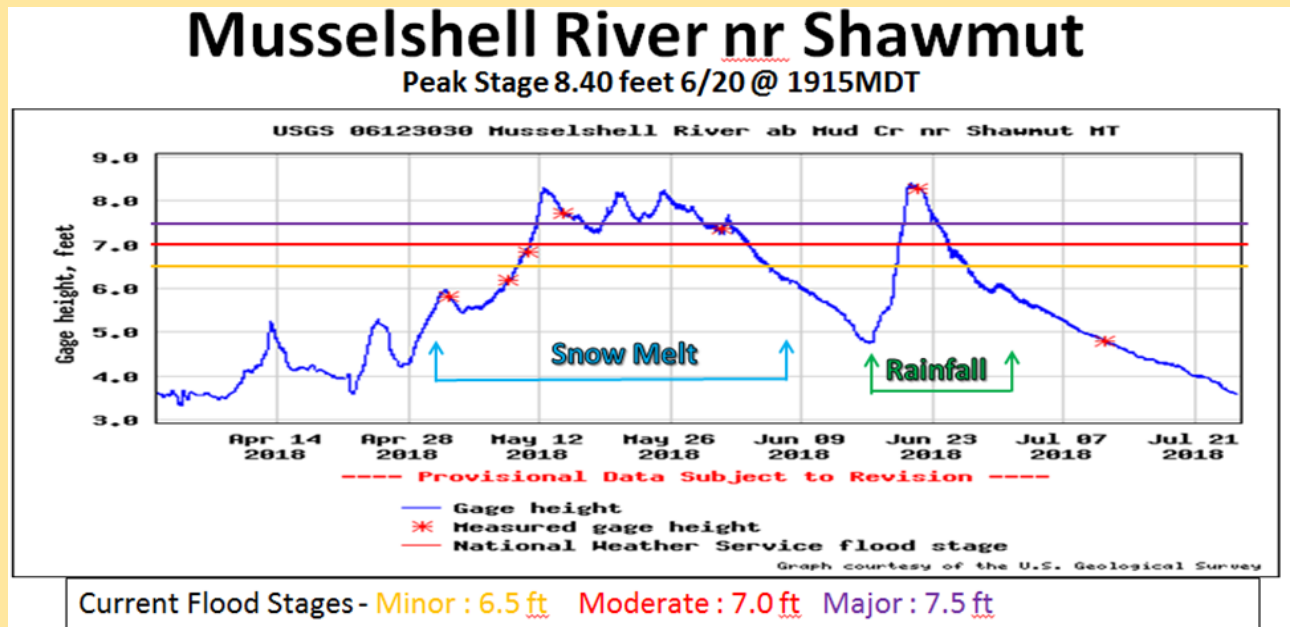
To improve our forecasts for these high winds, we have poured through historical wind data; developing a statistical model. Using this statistical model, we can better recognize when strong winds are likely, and assign a probability that strong winds will occur based on how often they occurred in similar events in the past. The end result is improved wind forecasts and messaging.



Example of Hazardous Weather Graphic. A graphical representation of the potential wind gusts as seen on our webpage during a high wind event.



A heavy winter snowpack resulted in a prolonged period of high flows on area streams and rivers during the late spring and summer. The Yellowstone, Shields, Boulder, Stillwater, Clarks Fork of the Yellowstone, Musselshell, Little Big Horn, and Tongue Rivers all exceeded flood stage at some point during the runoff period. Portions of the Musselshell River saw an extended time period above Major flood stage (see Shawmut trace). Even areas that didn't exceed flood stage saw significant bank erosion from the sustained high flows.

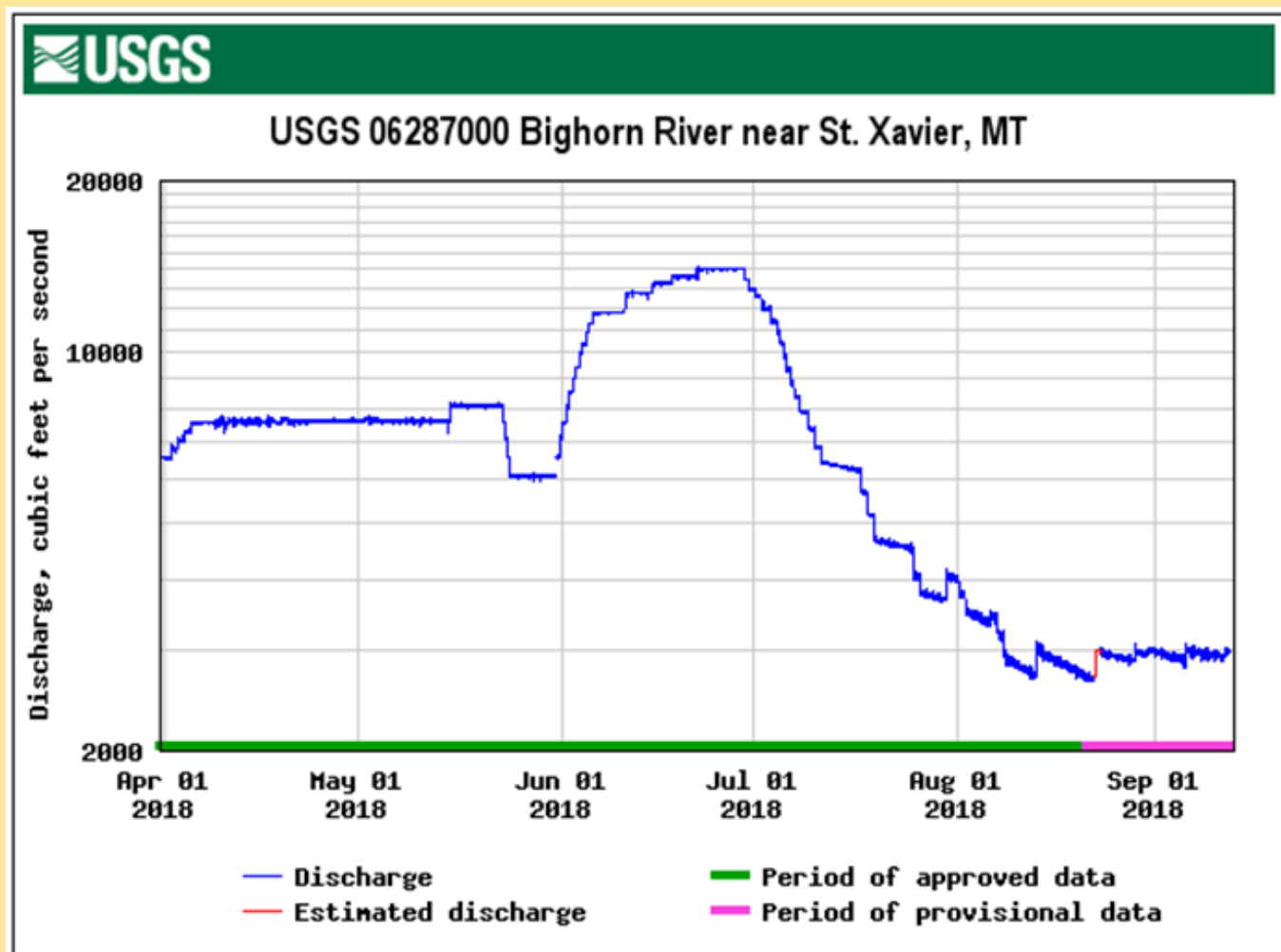


The Yellowstone River at Billings approached but stayed just below the flood stage of 13.5 feet.



Yellowtail Dam releases into the Big Horn River were at historic levels for the second year in a row, reaching 14 thousand cubic feet per second in late June.

As we head into the winter months our office will be working with local emergency officials to review this past runoff season to better prepare for future flooding events. This may include adjustments to flood stages in some areas for the 2019 runoff season.



Fall Data Tables

Fall Normals

Meteorological fall is considered the months of September, October and November. Here are the normal temperatures and precipitation for Billings, Miles City and Sheridan for the fall season. Normals are 30-year averages calculated from 1981 to 2010. All temperatures are in degrees Fahrenheit and all precipitation amounts are in inches.

Billings					
Date	High	Low	Average	Precipitation	Snowfall
9/1 - 9/30	73.1	47.5	60.3	1.30	1.1
10/1 - 10/31	59.4	37.1	48.2	1.18	4.1
11/1 - 11/30	45.3	26.3	35.8	0.63	6.5
9/1 - 11/30	59.3	37.0	48.2	3.11	11.7

Miles City				
Date	High	Low	Average	Precipitation
9/1 - 9/30	74.2	46.1	60.1	1.08
10/1 - 10/31	59.2	33.8	46.5	0.92
11/1 - 11/30	43.2	20.9	32.0	0.39
9/1 - 11/30	59.3	34.7	47.0	2.39

Sheridan				
Date	High	Low	Average	Precipitation
9/1 - 9/30	74.2	41.6	57.9	1.43
10/1 - 10/31	60.1	30.9	45.5	1.41
11/1 - 11/30	45.9	19.4	32.7	0.71
9/1 - 11/30	59.9	31.5	45.7	3.55



Winter Data Tables

Winter Normals

Meteorological winter is considered the months of December, January and February. Here are the normal temperatures and precipitation for Billings, Miles City and Sheridan for the winter season. Normals are 30 year averages calculated from 1981 to 2010. All temperatures are in degrees Fahrenheit and all precipitation amounts are in inches.

Billings					
Date	High	Low	Average	Precipitation	Snowfall
12/1-12/31	35.2	17.8	26.5	0.50	8.2
1/1-1/31	36.4	17.8	27.1	0.48	8.4
2/1-2/28	40.2	20.6	30.4	0.48	6.2
12/1-2/28	37.2	18.7	28.0	1.46	22.8

Miles City				
Date	High	Low	Average	Precipitation
12/1-12/31	30.9	9.7	20.3	0.29
1/1-1/31	30.0	8.9	19.5	0.32
2/1-2/28	35.5	13.2	24.4	0.23
12/1-2/28	32.4	11.5	22.0	0.84

Sheridan				
Date	High	Low	Average	Precipitation
12/1-12/31	35.2	10.6	22.9	0.56
1/1-1/31	36.2	11.4	23.8	0.56
2/1-2/28	39.0	14.2	26.6	0.54
12/1-2/28	36.7	12.9	24.8	1.66

Average Frost and Freeze Dates

The following are the normal first frost, freeze and hard freeze dates for Billings, Miles City and Sheridan. The frost temperature is based on 36 degrees Fahrenheit, the freezing temperature is based on 32 degrees Fahrenheit and the hard freeze temperature is based on 28 degrees Fahrenheit. The normal dates are based on a 30 year average from 1981 to 2010. The earliest frost, freeze and hard freeze dates are based on a period of record. Recordkeeping began for the Billings Airport in 1934, the Miles City Airport in 1937 and at the Sheridan Airport in 1907.

City	Normal First Frost	Earliest Frost on Record	Normal First Freeze	Earliest Freeze on Record	Normal First Hard Freeze	Earliest Hard Freeze on Record
Billings	Sep 24	Aug 24	Oct 4	Sep 4	Oct 11	Sep 11
Miles City	Sep 21	Aug 22	Sep 29	Sep 2	Oct 7	Sep 11
Sheridan	Sep 11	Jul 2	Sep 20	Aug 17	Oct 3	Aug 25

Prepare Before Your Next Trip – It Could Save Your Life!



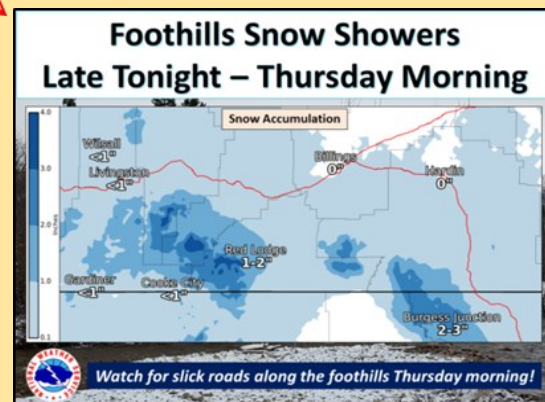
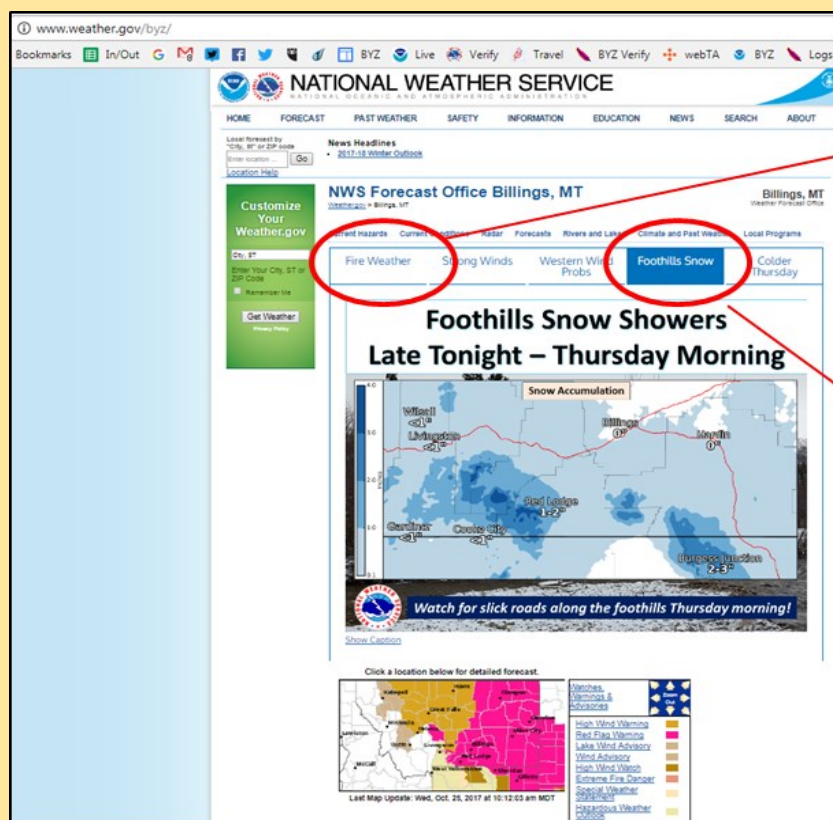
Now:

- Pack an emergency supply kit
- Winterize your vehicle

Just Before Your Trip:

- Stay mobile; fully charged cell phone
- Check current road conditions; follow the Department of Transportation
- Check the forecast!

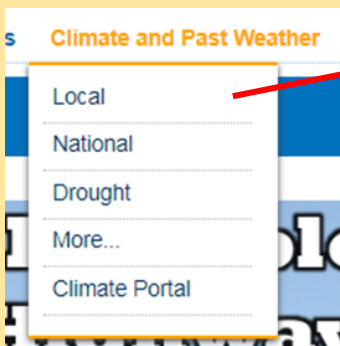
Checking the forecast is as easy as monitoring the [NWS webpage](http://www.weather.gov) on a daily basis. Bookmark it today! On our front page, we will feature a **Weather Story** whenever hazardous weather could be an impact over the week ahead. Check it before venturing out. Multiple hazards, could mean multiple tabs and multiple stories. Clicking on each tab will give you details on each hazard.



NWS Billings Webpage with sample Weather Stories

<http://weather.gov/billings>

Have you ever tried to locate a small piece of climate information from the National Weather Service web site and gotten frustrated? Well, here is a step by step way to help you navigate to basic climate information on our web site. First go to: <https://www.weather.gov/billings> Click on **Climate and Past Weather**:



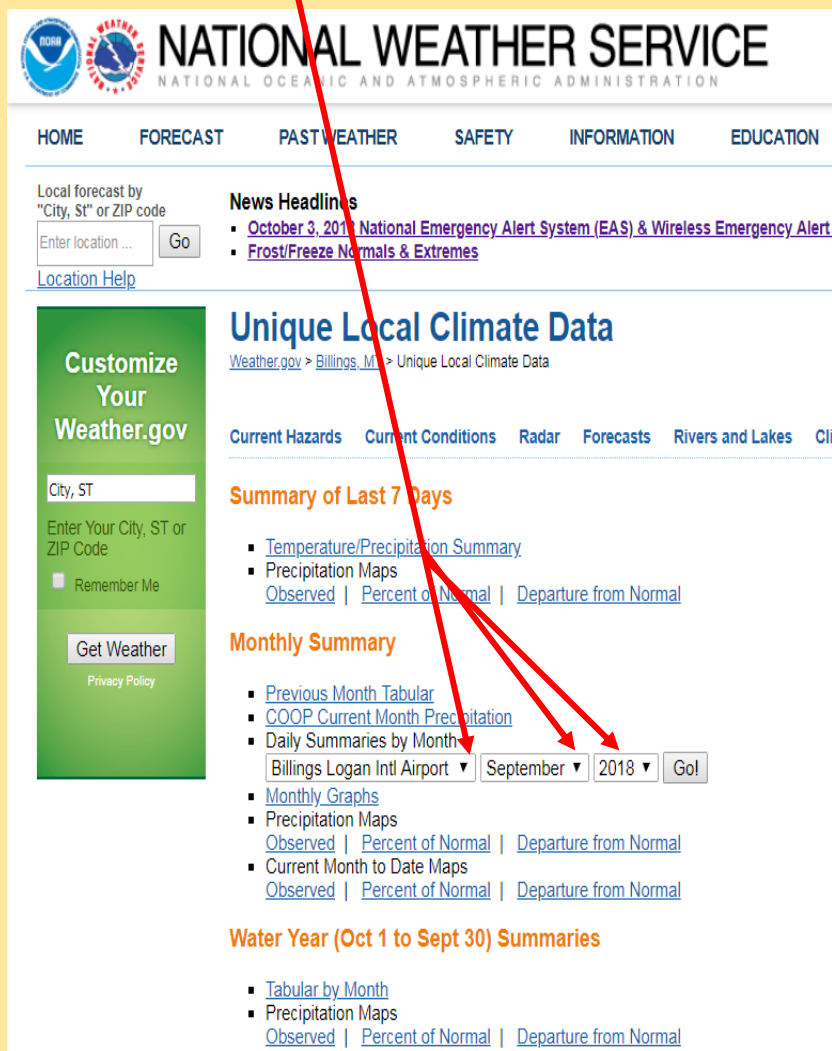
Local will send you to the Climate screen where there are many resources. But for this feature, we will be clicking on the 5th tab across labeled **Local Data/Records**.



Click Here to continue to the Unique Local Climate Data Page.



The Unique Local Climate Data page is where you select the station you are looking for. Click on the **Station drop-down menu**, the month, the year, and click GO



NATIONAL WEATHER SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

HOME FORECAST PAST WEATHER SAFETY INFORMATION EDUCATION

Local forecast by "City, St" or ZIP code
Enter location ... Go

Location Help

Customize Your Weather.gov

City, ST
Enter Your City, ST or ZIP Code
Remember Me
Get Weather
Privacy Policy

News Headlines

- October 3, 2018 National Emergency Alert System (EAS) & Wireless Emergency Alert
- Frost/Freeze Normals & Extremes

Unique Local Climate Data
Weather.gov > Billings, MT > Unique Local Climate Data

Current Hazards Current Conditions Radar Forecasts Rivers and Lakes Climate Data

Summary of Last 7 Days

- Temperature/Precipitation Summary
- Precipitation Maps
Observed | Percent of Normal | Departure from Normal

Monthly Summary

- Previous Month Tabular
- COOP Current Month Precipitation
- Daily Summaries by Month
Billings Logan Intl Airport | September | 2018 | Go!
- Monthly Graphs
- Precipitation Maps
Observed | Percent of Normal | Departure from Normal
- Current Month to Date Maps
Observed | Percent of Normal | Departure from Normal

Water Year (Oct 1 to Sept 30) Summaries

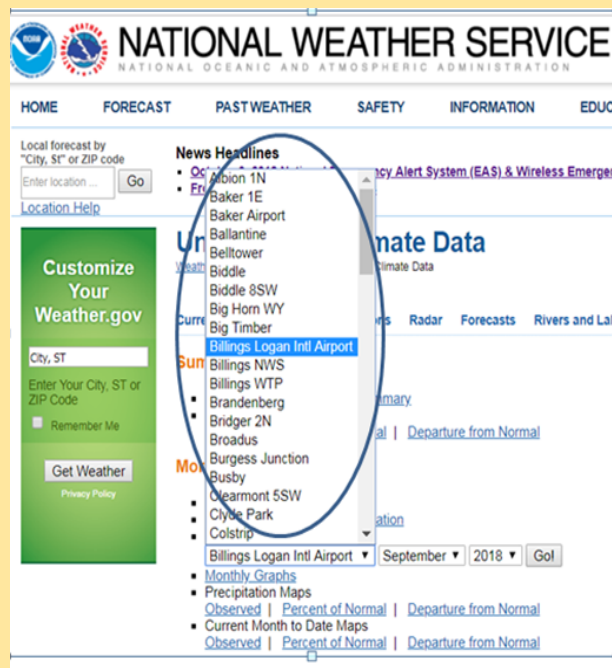
- Tabular by Month
- Precipitation Maps
Observed | Percent of Normal | Departure from Normal

This Unique Local Climate Data Page has a wealth of information. Please feel free to peruse through it, and our entire website, to learn more about what we do!



Once you have selected your station, month and year, click on Go, and the screen will change to a spreadsheet style page with the station name, month and year of the data being presented. On the next page, you will see the data that you are searching for. Just above the spreadsheet you will see a link called:

[Click here for an explanation of what the following numbers mean](#)



NATIONAL WEATHER SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

HOME FORECAST PAST WEATHER SAFETY INFORMATION EDUCATION

Local forecast by "City, St" or ZIP code
Enter location ... Go

Location Help

Customize Your Weather.gov

City, ST
Enter Your City, ST or ZIP Code
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News Headlines

- October 1N
- Baker 1E
- Baker Airport
- Ballantine
- Beltower
- Biddle
- Biddle 8SW
- Big Horn WY
- Big Timber
- Billings Logan Intl Airport
- Billings NWS
- Billings WTP
- Brandenberg
- Bridger 2N
- Broadus
- Burgess Junction
- Busby
- Clearmont 5SW
- Clyde Park
- Colstrip
- Billings Logan Intl Airport | September | 2018 | Go!
- Monthly Graphs
- Precipitation Maps
Observed | Percent of Normal | Departure from Normal
- Current Month to Date Maps
Observed | Percent of Normal | Departure from Normal



Here is the spreadsheet of the station that was requested. Notice the vertical dash line separating the **Observed** data on the left and the **Normals** on right. Each day of the month is represented with the observed High Temp, Low Temp, Observation Temperature (not reported at airport locations), Precipitation, Snowfall, Snow Depth, Avg Wind speed, & finally Peak Wind speed and direction. The totals at the bottom of each column are either an average (temps/wind) or a total (precip).

For more information, please visit the link in the large circle below for an explanation. We hope this is helpful for those who research data for various needs.

City, ST

Enter Your City, ST or ZIP Code

☐ Remember Me

Get Weather

[Privacy Policy](#)

Climate Data for

Make another selection

Billings Logan Intl Airport ▾ September ▾ 2018 ▾ **Go!**

Disclaimer: These data are preliminary and are unofficial. [The National Climatic Data Center](#) is the official source of climate data. **Questions?** [E-mail us](#) or call (406) 652-0851.

[Click here for an explanation of what the following numbers mean](#)

Climate Station: BILLINGS INTL AP MT Table Created at: 10:55 UTC 09/23/2018
Climate Data for: SEP 2018 Latitude: 45.81 Longitude: 108.54 Elevation: 3566

-----Observed-----											-----Normals-----					
Day	High Temp	Low Temp	Obs Temp	Mean Temp	Pcpn	Snfl	Depth	HDD	CDD	Avg Spd	Pk Spd	Wnd Dir	High Temp	Low Temp	Mean Temp	Pcpn
01	83	52	M	68	0.00	0.0	0	0	3	9.5	30	010	81	53	67	0.03
02	80	48	M	64	0.00	0.0	0	1	0	5.7	14	030	80	52	66	0.04
03	87	50	M	69	0.00	0.0	0	0	4	8.8	39	010	80	52	66	0.03
04	67	46	M	57	0.00	0.0	0	8	0	10.3	24	040	79	52	65	0.04
05	74	46	M	60	0.00	0.0	0	5	0	6.3	17	020	79	51	65	0.04
06	87	52	M	70	T	0.0	0	0	5	9.4	38	350	78	51	65	0.04
07	88	58	M	73	0.00	0.0	0	0	8	6.4	15	190	78	51	64	0.04
08	87	61	M	74	0.00	0.0	0	0	9	13.0	29	220	77	50	64	0.05
09	81	55	M	68	0.00	0.0	0	0	3	8.3	21	230	77	50	63	0.04
10	85	50	M	68	0.00	0.0	0	0	3	7.2	22	330	76	50	63	0.04
11	75	51	M	63	0.00	0.0	0	2	0	9.7	24	080	76	49	62	0.05
12	70	47	M	59	0.00	0.0	0	6	0	8.0	20	350	75	49	62	0.04
13	74	52	M	63	0.00	0.0	0	2	0	8.2	23	040	74	48	61	0.05
14	66	50	M	58	0.00	0.0	0	7	0	9.7	21	050	74	48	61	0.04
15	71	45	M	58	0.00	0.0	0	7	0	8.3	24	330	73	48	61	0.04
16	75	48	M	62	T	0.0	0	3	0	8.2	29	270	73	47	60	0.05
17	68	49	M	59	0.00	0.0	0	6	0	6.0	19	330	72	47	60	0.04
18	73	46	M	60	0.00	0.0	0	5	0	7.3	21	010	72	47	59	0.04
19	52	43	M	48	0.03	0.0	0	17	0	8.2	26	020	71	46	59	0.05
20	65	43	M	54	0.08	0.0	0	11	0	9.9	44	320	71	46	58	0.04
21	73	38	M	56	0.00	0.0	0	9	0	4.0	14	210	70	46	58	0.05
22	84	48	M	66	0.00	0.0	0	0	1	11.6	24	020	70	45	57	0.05
MTD	75.7	49.0		62.4	0.11	0.0		89	36	8.4	44	320	75.3	49.0	62.1	0.93
DPT	+0.4	+0.0		+0.3	-0.82	-0.5		-22	-10							
SON	75.7	49.0		62.4	0.11	0.0		89	36				75.3	49.0	62.1	0.93
DPT	+0.4	+0.0		+0.3	-0.82	-0.5		-22	-10							
YTD	60.8	38.2		49.5	16.49	0.0*		148*	554				63.8	40.0	51.9	10.98
DPT	-3.0	-1.8		-2.4	+5.51	-0.5		+5	-67							

(* - Yearly Total runs from July 1st to June 30th)



Look for Weather-Ready Tips on Social Media
Every Wednesday of the Year!



The graphic features a blue background with the NOAA logo on the top left and the National Weather Service logo on the top right. The main title "Weather-Ready Wednesday" is in large yellow letters, with the subtitle "Prepare Your Car for Emergencies" in white script below it. The central white box is titled "BUILDING AN EMERGENCY SUPPLY KIT FOR YOUR CAR" and contains a car silhouette with the text "WHY? BECAUSE YOU NEVER KNOW WHEN YOU WILL ENCOUNTER WINTER WEATHER OR AN EMERGENCY ROAD CLOSURE." Below the car is the "AMERICA'S PrepareAthon!" logo. Surrounding the car are 15 icons representing emergency supplies: a cell phone charger, first aid kit, jumper cables, tire chains or snow tires, flares, water and snacks, flashlight, bag of sand or cat litter, boots/mittens/warm clothes, blanket, tow rope, shovel/ice scraper/snow brush, and a full tank of gas.

Weather-Ready Wednesday
Prepare Your Car for Emergencies

BUILDING AN EMERGENCY SUPPLY KIT FOR YOUR CAR

WHY?
BECAUSE YOU NEVER KNOW WHEN YOU WILL ENCOUNTER WINTER WEATHER OR AN EMERGENCY ROAD CLOSURE.

AMERICA'S PrepareAthon!
BE SMART. TAKE PART. PREPARE.

CELL PHONE, CHARGER
FIRST AID KIT
JUMPER CABLES
TIRE CHAINS OR SNOW TIRES
FLARES
WATER, SNACKS
FLASHLIGHT
BAG OF SAND OR CAT LITTER
BOOTS, MITTENS, WARM CLOTHES
BLANKET
TOW ROPE
SHOVEL, ICE SCRAPER, SNOW BRUSH
FULL TANK OF GAS

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Winter Preparedness

Winter Weather Information & Safety

<http://www.nws.noaa.gov/om/winter/index.shtml>

Red Cross Winter Storm Safety Checklist (Downloadable PDF)

https://www.redcross.org/content/dam/redcross/atg/Chapters/Division_1_-_Media/Denver/Denver_-_PDFs/EmergencyPreparednessChecklist.pdf

Education

JetStream — An Online School for Weather

<https://www.weather.gov/jetstream/>

Local Climate Records

<http://www.nws.noaa.gov/climate/index.php?wfo=byz>

Kids!

SciJinks. It's all about weather!

<https://scijinks.gov/>

Learn Science and Safety with Owlle Skywarn!

<http://www.weather.gov/owlle/>

Happy Fall To You All!

Have A Safe And Happy Holiday Season!

