

2023 Weather in Review



Severe Thunderstorm in Custer County (Heitman)

The following is a weather review for the Billings forecast area, which includes southeast Montana, parts of south-central Montana, and Sheridan County in Wyoming.

Overall, 2023 was a warm and wet year. Temperatures and precipitation were above normal at each of our four main climate stations. In fact, Sheridan had its 5th wettest year on record, and wettest since 1955. Snowfall during the 2022-23 winter was close to normal, but mountain snowpack melted out a couple weeks early in the spring and most river flows peaked in late May or early June. The year will be most remembered by the amount of flooding (especially flash flooding) in June, which was a very wet and humid month. The weather pattern kept high atmospheric moisture in our region and favored slow-moving showers and thunderstorms on many days. As a result, there was significant flash flooding but not a lot of severe weather (which needs strong wind shear to be active). It was the 3rd wettest June on record at Billings and Sheridan, and the 4th wettest at Livingston. See the list of weather events below for a summary of June's flooding.

The wet spring and early summer allowed grasses to remain green through much of the summer, and thus, the wildfire season in our region was very quiet. The first lower elevation snow of the fall occurred in October, as happens often, but this was followed by dry and warm conditions in November and most of December. A portion of the region received some snowfall just before Christmas. In fact, with an inch of snow on the ground, Billings had a white Christmas for the 3rd consecutive year and 12th time in the past 16 years.

Below are 2023 statistics for each of our main climate stations.

	Average Temp	Total Precipitation	Warmest Temp	Coldest Temp	Wettest Day	Peak Wind
Billings	49.4° + 1.2° 11 th warmest	17.46" + 3.15" 16 th wettest	101° (July 24, August 15)	-18° (February 24)	2.19" (June 2)	65 mph (October 17)
Livingston	46.5° + 1.0° 20 th warmest	14.93" + 0.38" 38 th wettest	100° (August 17)	-25° (January 29)	0.98" (September 21)	73 mph (January 31, March 2)

Miles City	47.7° + 1.5° 16 th warmest	14.61" + 1.73" 34 th wettest	104° (July 24)	-25° (February 24)	1.60" (September 22)	63 mph (August 30)
Sheridan	46.2° + 0.8° 27 th warmest	22.55" + 7.62" 5 th wettest	101° (July 24)	-27° (January 30)	1.48" (October 12)	55 mph (August 30)
Baker	44.6° + 1.1°	18.23" + 3.65"	102° (July 24)	-27° (February 24)	1.37" (June 9)	61 mph (March 11)

The following tables are lists of daily records either tied or broken at our four main climate sites (excluding Baker due to its short period of record). Records go back to 1934 at Billings, 1937 at Miles City, 1907 at Sheridan and 1948 at Livingston.

Billings Records	
Record High Temps	80° on April 11
	101° on August 15
Record Low Temps	-18° on February 24
	42° on June 22
	8° on October 26
	9° on October 27
Record Precipitation	0.51" on March 25
	0.40" on March 26
	0.74" on May 5
	2.19" on June 2
	0.91" on June 23
Record Snowfall	0.57" on October 12
	3.5" on February 14
	5.4" on March 25
	5.0" on March 26
	3.0" on October 25

Miles City Records	
Record High Temps	80° on April 10
	88° on April 11
Record Low Temps	-25° on February 24
	46° on July 5
	-3° on October 27
	-2° on October 28
Record Precipitation	0.61" on June 23
	1.04" on August 20
	1.60" on September 22

Sheridan Records	
Record High Temps	63° on December 16
	60° on December 20
Record Low Temps	-25° on February 24
	-1° on October 27
Record Precipitation	0.31" on February 20
	0.81" on May 26
	1.00" on June 10
	0.20" on August 4
	0.85" on August 5
	1.45" on September 4
	1.03" on September 22
1.48" on October 12	

Livingston Records	
Record High Temps	75° on April 10
	98° on August 15
	80° on October 19
	78° on October 20
	59° on December 6
	56° on December 20
	57° on December 21
56° on December 22	
Record Low Temps	-25° on January 29
	8° on April 5
	34° on June 21
	33° on June 22
	5° on October 27
Record Precipitation	-12° on October 28
	0.31" on January 27
	0.87" on June 3
	0.37" on June 23
	0.38" on August 9

The following is a chronological list of significant or noteworthy weather events that occurred across the region in 2023.

January 27-28: Heavy snow impacted the foothills behind a Canadian cold front. Some locations along the northeast slopes of the Beartooth and Bighorn Mountains received 2 feet of snow. Some of the higher amounts included: Luther & Story 28", Absarokee 21", Dayton 20", Red Lodge area 16-20", Livingston & Big Timber 10", Sheridan area 8-11".

January 28-30: A brief cold snap brought sub-zero temperatures across the region. Livingston broke a daily record low with -25° on the 29th. Some other lows during this period included: Clearmont -31°, Busby -28°, Sheridan -27°, Columbus -25°, Wilsall -24°, Big Timber -22°, Red Lodge -21°, Billings & Miles City -11°.



January 30 – February 1: Strong SW-W winds produced significant blowing & drifting snow along the western foothills. I-90 was closed from Big Timber to Livingston, and severe driving conditions were reported on US-191 north of Big Timber. Peak gusts included: Livingston 73 mph, Big Timber & Pine Creek 59 mph. Photo on left by Lekse on Jan 31.

February 14: Accumulating snow impacted the region, with greatest amounts along the foothills. Amounts included: Mystic Lake 20", Red Lodge area 15-20", Story area 10-20", Absarokee 12", Dayton 10", Fort Smith 8.2", Big Timber 7", Livingston & Sheridan 6", Ekalaka 5.5", Billings area 3-6". Image on right was in southern Rosebud County on US-212.



February 20-24: A prolonged snow event w/ cold temps impacted the region. I-90 was closed for a time from Sheridan to Buffalo. Snow amounts included: up to 29" in the mtns near Cooke City, up to 24" in the Story area, Busby 14", Red Lodge area 8-14", Birney 17SSE 12", Sonnette 7SSW 10", Sheridan area 7-10", Roundup area 5-10", Ridge 9", Dayton & Fishtail 8", Billings area 4-8", Wyola & Joliet 6". A few low temps included: Huntley -35°, Clearmont -33°, Brandenburg & Plevna -29°, Story -28°, Baker -27°, Red Lodge & Broadus -26°.

March 11: Blizzard conditions impacted Fallon County, closing roads (including Highways 12 and 7) in the area (a result of strong NW winds, light snow and recently fallen snow). Baker airport reported visibility to a ¼ mile or less frequently from 8am to 5pm. Peak gusts: Baker 61 mph, Plevna 58 mph, Cannonball Creek Raws 57 mph. Blowing snow impacted travel across other parts of southeast MT, but worst conditions were in Fallon County.

March 24-27: A prolonged period of ascent and easterly winds produced heavy snowfall from Billings westward and southward. The mountains above Red Lodge picked up around 5 feet of snow, while our coop observer in Red Lodge reported a 3-day total of 44.5 inches! Some other big amounts included: Nye 14W 40", Joliet 26", Pine Creek 23.8", Big Timber 23.5", Fishtail 23", Story 19", Livingston 18", Fort Smith 16", Park City 15", Big Horn 13", Billings area 8-12". Photo on right is a scene from Red Lodge, courtesy of Q2.



April 4-5: A storm system moving through WY brought heavy snow to the southern foothills. Red Lodge Mountain picked up 25", Mystic Lake 18", Red Lodge area 12-14", Story up to 20", Sheridan 6".

April 12: A result of a stretch of warm days and mid elevation snow melt, the Shields River near Livingston rose to around 6 feet, about ½ foot above flood stage. Minor low land flooding was reported in the Shields valley, from smaller streams in addition to the river. Fiddle Creek Road was damaged.

April 18-20: Precipitation fell over much of the region, with some lower elevations even picking up some wet snow. Nearly 2" of precip fell on the Crazy Mountains, 1-1.50" in the Roundup area, and 1.11" at Forsyth. Otherwise, 0.25-0.75" were common. Up to 6" of wet snow fell in the Roundup area, 9" at a coop station 18 miles north of Ryegate, and



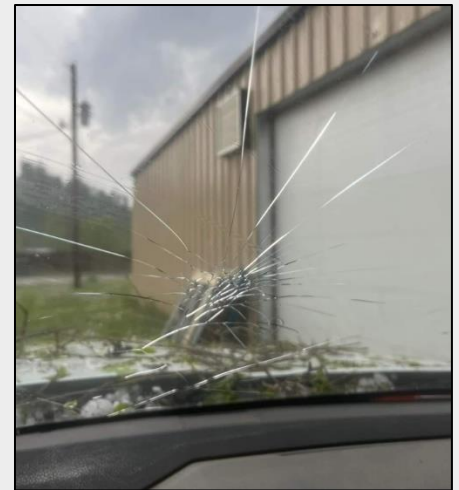
around 10" near Melstone. To the left is a photo of Red Bluff in the Bull Mountains, taken from the Billings airport on the 20th.

May 7: A funnel cloud was spotted near Powderville. Thunderstorm activity was non-severe.

May 10-14: Wet weather impacted the region over this 5-day period. Heaviest amounts (1" or more) fell along the foothills and in southeast MT. Up to 4" of precipitation fell over the Bighorn Mountains, with 2-3"

in the Story area. There was no flooding.

May 24: The first severe storm of the season produced up to baseball size hail at Lame Deer, where there were several reports of car damage. Another storm produced quarter size hail near Miles City and Hathaway. These storms also produced heavy rain – 2.20" fell 20 miles northwest of Miles City. Photos on right from Takesenemy in Lame Deer.



May 26: Severe storms produced quarter size hail near Dayton and Sheridan, and at Ridge. Ranchester reported hail up to 1.25" diameter.

May 27: During the early evening, a thunderstorm produced heavy rain (1.75"), small hail (pea size) and localized street flooding in Miles City. Thunderstorms in the Billings area produced some locally heavy rain, but more notably, a funnel cloud was spotted southeast of Laurel.

May 28: A funnel cloud was spotted over the Bull Mountains south of Roundup (shown on right).



June 1-3: A slow-moving weather system combined with abundant moisture brought a 3-day period of heavy rain and flooding in some areas. There were several reports of 5+ inches of rain from the west side of Billings to Laurel, Rapelje and Molt. Over 4" of rain fell just southeast of Roundup in the Bull Mountains. Several rural roads were washed out southeast of Roundup. Urban flooding was widespread from Laurel to Billings, and Zimmerman Trail was closed due to rock slides. Total flood damage costs to the city were estimated to be \$1M. Billings' rainfall of 2.12" on the 2nd was a daily record, and



and tied for the 12th wettest day on record. Photos on left and right are East Parrot Road near Roundup (Merison) and 29th & Broadwater in Billings (Ojeda), respectively.

June 3-11: A remarkably moist air mass with



instability and weak easterly flow aloft produced several days of thunderstorm activity, with locally heavy rain and flash flooding. The Billings airport reported a dew point of at least 60° on seven consecutive days (June 3-9). NWS Billings issued a total of 19 flash flood warnings over these 9 days, the most over such a short time in many years. Some of the flash flooding included:

- **June 6:** County Road washed out 5 miles north of Columbus due to flooding on Keyser Creek; street flooding in downtown Columbus.
- **June 8:** S-313 from MP 18 to 19 (south of Hardin) water on road.
- **June 8:** Numerous homes flooded in Lavina, water flowing down main street (not from the Musselshell), flooding also in and near Ryegate.
- **June 8:** Flooding just east of Roberts, near Clear Creek and Cherry Springs Road.
- **June 9:** Rainfall pushed the Musselshell River at Roundup above flood stage for several hours.
- **June 10:** Widespread heavy rain over the Bighorns caused flooding on Little Goose Creek (near Big Horn) and a portion of Big Goose Creek, County Road 66 closed due to water on it, water on Woodland Park Road at Little Goose Bridge.
- **June 11:** Flooded roads northwest of Forsyth along Big Porcupine Creek, include Hammond Valley Road (took some time to reach Forsyth from the Ingomar area).



Photos are from near Roberts (below – Devries) and in Columbus (right).



June 15-16: Little Goose Creek had minor flooding in and around Sheridan and Big Horn, a result of heavy rains in the Bighorns the day before.

June 19: A severe thunderstorm produced a measured 83 mph wind gust 28 miles WSW of Ismay (Custer County). The storm also produced hail the size of quarters. Another storm downed several cottonwood trees 11 miles southeast of Miles City.

June 22-27: A moist and unstable air mass resulted in several days of heavy rains and localized flooding. It was another remarkable wet stretch of weather.

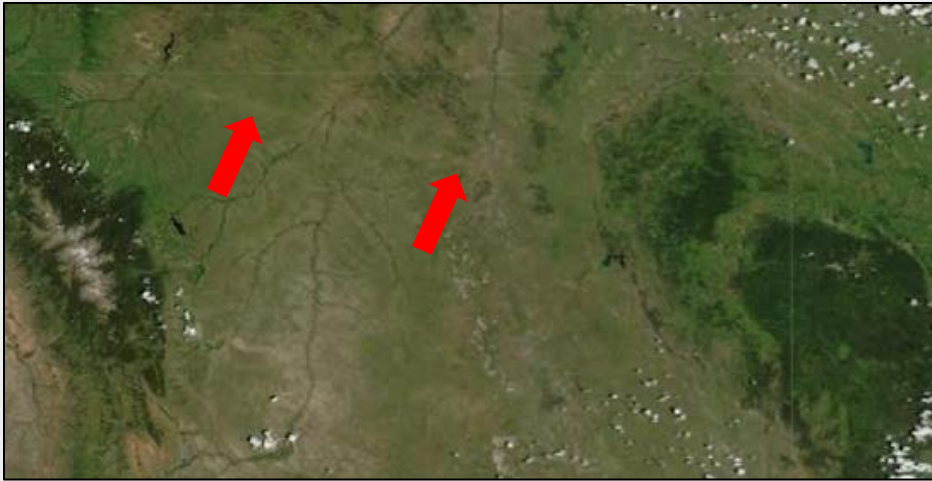
June 23: Very heavy rain in the Rapelje area (estimated at over 7") caused flash flooding in the area, including on Keyser Creek which flows into the Yellowstone River at Columbus.

June 24: Railroad bridge collapses, and train plunges into the Yellowstone River near Reed Point. Also on this day, Beartooth Pass closed for a time due to heavy snow.

June: It was the 3rd wettest at Billings and Sheridan, 4th wettest at Livingston. For Billings, the wettest June since 1944. Some monthly totals are shown on right.

July 10: A thunderstorm moving over Bozeman Pass produced a peak gust of 65 mph at Livingston.

SITE	JUNE PRECIPITATION
Melville 4 W	11.28"
Ryegate	10.05"
Burgess Junction	9.79"
Reed Point 5 SE	9.62"
Columbus	8.19"
Huntley	8.10"
Hardin	7.57"
Roundup 15 SW	7.20"
Billings NWS	7.06"
Red Lodge	6.92"
Big Timber	6.84"
Billings Airport	6.36"



July 11: A few severe thunderstorms impacted the region, including: 1.5" hail 20 miles NNE of Baker, 2.75" (baseball size) hail 9 miles north of Leiter and 14 miles NNE of Sheridan close to MT line, a 74-mph wind gust at Cannonball Creek Raws (13NE Baker), 2.50" hail near Decker, 1.50" hail near Wyarno (broke windows), 1" hail just south of Miles City, 74 mph wind gust and 1.75" hail near Ingomar (damaged coop equipment). To the left is a photo from NASA's Aqua Satellite showing a

swath of damage from the supercell's large hail (2-2.75") from near the Bighorns toward the Black Hills.

August 3-6: Periods of heavy rain impacted far southeast MT. A few 4-day rainfall totals: Webster 5WNW 5.30", Plevna 4.56", Ismay 4.50", Ekalaka 14ESE 4.20", Alzada 13ENE 4.00".

August 18: A severe thunderstorm produced a 64-mph wind gust at Livingston.

August 21: A severe thunderstorm produced a 59-mph wind gust at the Billings airport.

August 22: Heavy rain produced street flooding in Miles City. The airport measured 1.33" of rain.

August 30: A severe thunderstorm produced strong winds (gust 63 mph at Frank Wiley Field) and some tree damage in Miles City (shown on right, from Big Sky Weather). Elsewhere, 64 mph gust near Angela, 63 mph gust near Hathaway, 59 mph gust at Rock Springs. Strong thunderstorm winds also occurred in parts of the west, including 63 mph south of Reed Point and near Absarokee, 61 mph near Molt and at the Livingston airport.



September 4: A thunderstorm produced heavy rain near Baker, with a spotter reporting 2.20" in about 45 minutes. Heavy rain also fell on the east side of the Bighorns. Some total rainfall reports: Story 2W 3.20", Baker 6NE 2.40", Clearmont 5NNE 2.22", Big Horn 1.91", Ranchester 1.62".

September 18: Decaying showers and weak thunderstorms in the Paradise Valley caused a peak wind gust of 69 mph at the Livingston airport.

September 21-23: A slow-moving storm system brought widespread rain, with most locations seeing between 0.50-1.50". Some locations received over 2" of rain, with the highest being 3.13" from an observer east of Ingomar. Elevations above 9000 feet received accumulating snow. The Beartooth Highway was closed above Vista Point. WYDOT reported 5-foot drifts on the pass. To the right is a view of Mount Wood on the morning of the 24th (Lorash).



October 11-12: An upper low tracking through Wyoming brought significant rainfall and mountain snow to southern areas. Elevations above 7500 feet on the east side of the Beartooths and Bighorns picked up 1-3 feet of snow (and up to 4" of water). Rainfall amounts included: Big Horn 6.4SSW 3.74", Dayton 3.52", Fort Smith 3.48", Red Lodge area about 3", Sheridan area 1.50-2.50", Fishtail 2.04". Sheridan airport's precip of 1.48" on the 12th was a daily record, and the 3rd wettest October day on record.

October 17: A cold front brought strong W-NW winds to the region. Peak gusts included: Billings airport 65 mph, Rock Springs 63 mph, Harlowton 61 mph, Rapelje 59 mph, Miles City 56 mph.



October 24-30: Periods of snow impacted the region from the 24-27th. This was followed by cold temperatures as an air mass originating from the Arctic settled in from the 27-30th. At the weather system's onset, many areas saw a period of freezing drizzle before the snow began (especially Billings eastward), resulting in widespread icy roads and many slide offs. **SNOW:** Greatest amounts in the west, southern foothills and east. Amounts included: Mystic Lake 18", Livingston area 12-16", Ashland 11.9E 12", Melville 11", Big Horn 10.5", Baker 24.7SSE 10", Harlowton 8", Sheridan area 6-9", Ekalaka 8.7", Billings area 3-5". **COLD:** Livingston's low of -12° on the 28th was a daily record, and the coldest so early in the fall (previous first occurrence of -12° was Oct 27). Other lows: Harlowton 11NW -12°, Ingomar 9E -11°, Brandenburg -10°, Busby -7°. Daily record cold highs were set at Billings (20°), Miles City (16°) and Livingston (17°) on the 27th.

November 11: A peak wind gust of 67 mph was observed at the Livingston airport.

November 23-24: Snow fell over the southern mountains and foothills. The Luther to Red Lodge area picked up 10-14" of snow, Mystic Lake 10", Story & Burgess Junction 5-7".

December 3-4: Strong westerly winds descended the southern Crazy Mountains at night and produced a peak gust of 74 mph at the Big Timber airport. Two separate 70+ mph gusts were observed (11:15pm and 12:15am).

December 23-24: A period of generally light snow impacted parts of the region. Snow was heaviest along the southern foothills with 4-6" at Mystic Lake, Red Lodge and Story. Billings airport received 1.8" on the 23rd, and an inch of snow cover persisted through Christmas morning, making it a white Christmas despite having no snow for the previous two months! It was the 3rd straight white Christmas at Billings, and the 12th in the past 16 years.

Have a great 2024 everyone!!