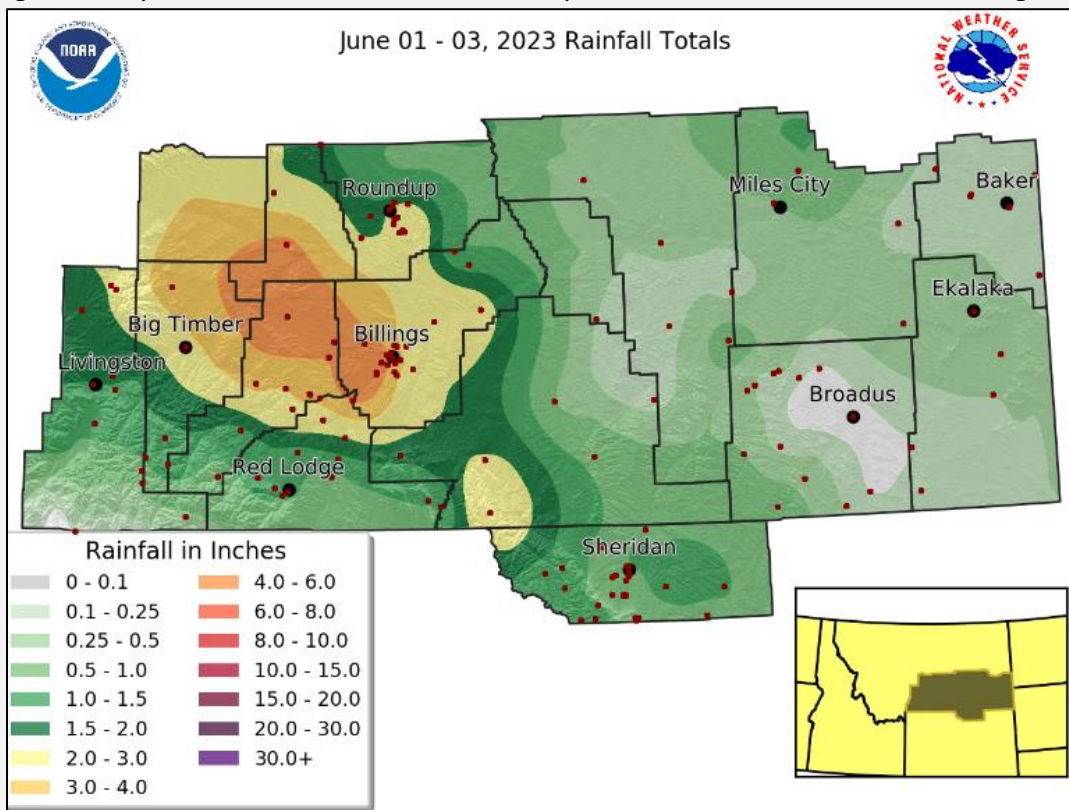


Heavy Rain & Flooding

June 1-3, 2023

National Weather Service – Billings, MT

HEAVY RAIN: Periods of heavy rain began during the afternoon of June 1st and lingered into the 3rd. Most widespread precipitation was west of Rosebud County, but locally heavy rain with thunderstorms occurred to the east as well. Several locations north the foothills received in excess of three inches of rain. This resulted in localized flooding of urban areas (including Billings) and other smaller streams and low-lying areas. Main stem rivers did not see flooding, since heaviest precipitation was not over the mountains and foothills. Furthermore, mountain snow melt was 2-3 weeks ahead of schedule, so contributions from melting snow water in the high country was not a factor. Below is a map of observed rainfall across the region.



The following table shows some of the highest 3-day rainfall reports we received.

SITE	3-DAY TOTAL
Laurel 6.8ENE	5.65"
Billings 7SW	5.50"
Rapelje	5.42"
Billings 4.2WSW	5.29"
Laurel 4SSW	4.90"
Molt	4.90"
Ryegate 0.3E	4.79"
Roundup 3.3SE	4.09"

Melville 4.7W	4.05"
Molt 9.8E	4.05"
Columbus 7.2E	3.81"
Reed Point 5SE	3.66"

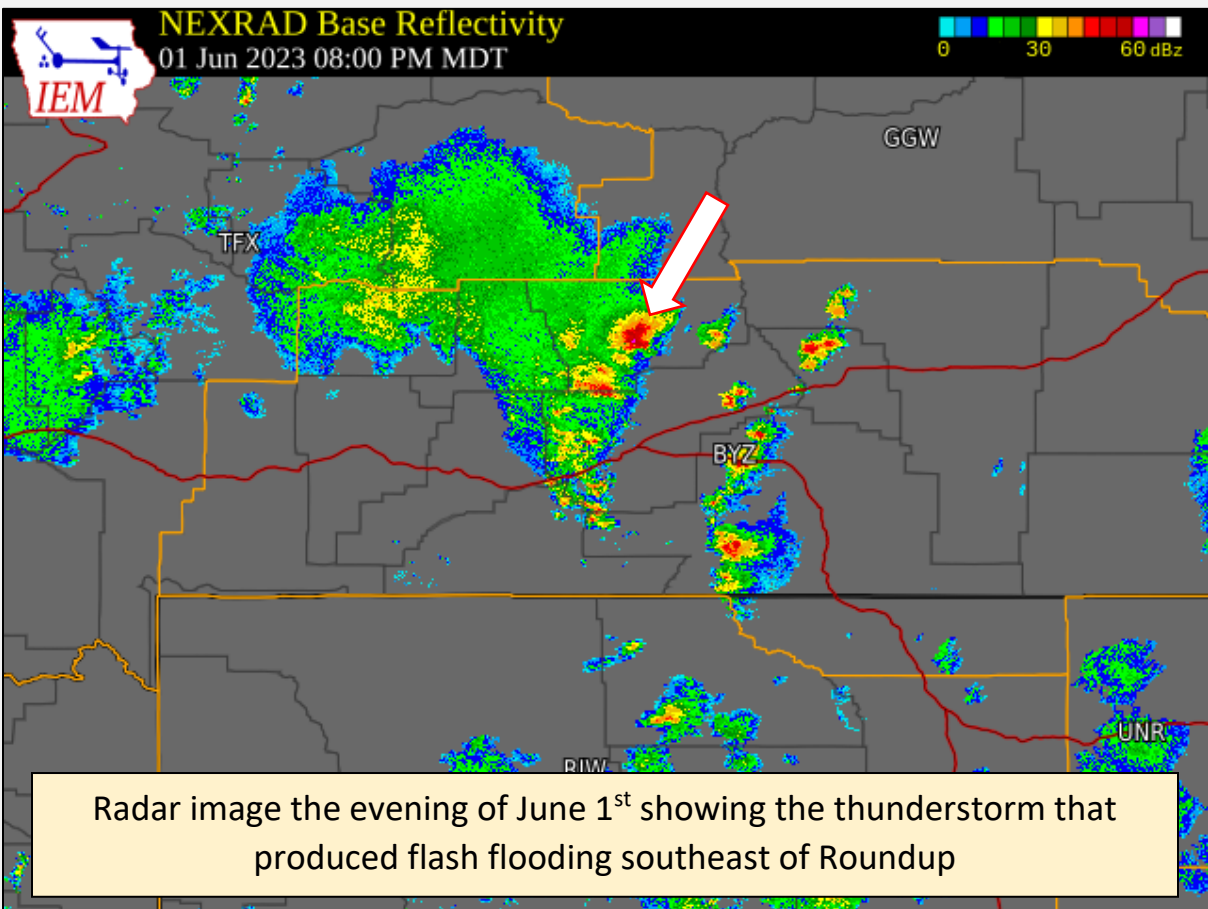
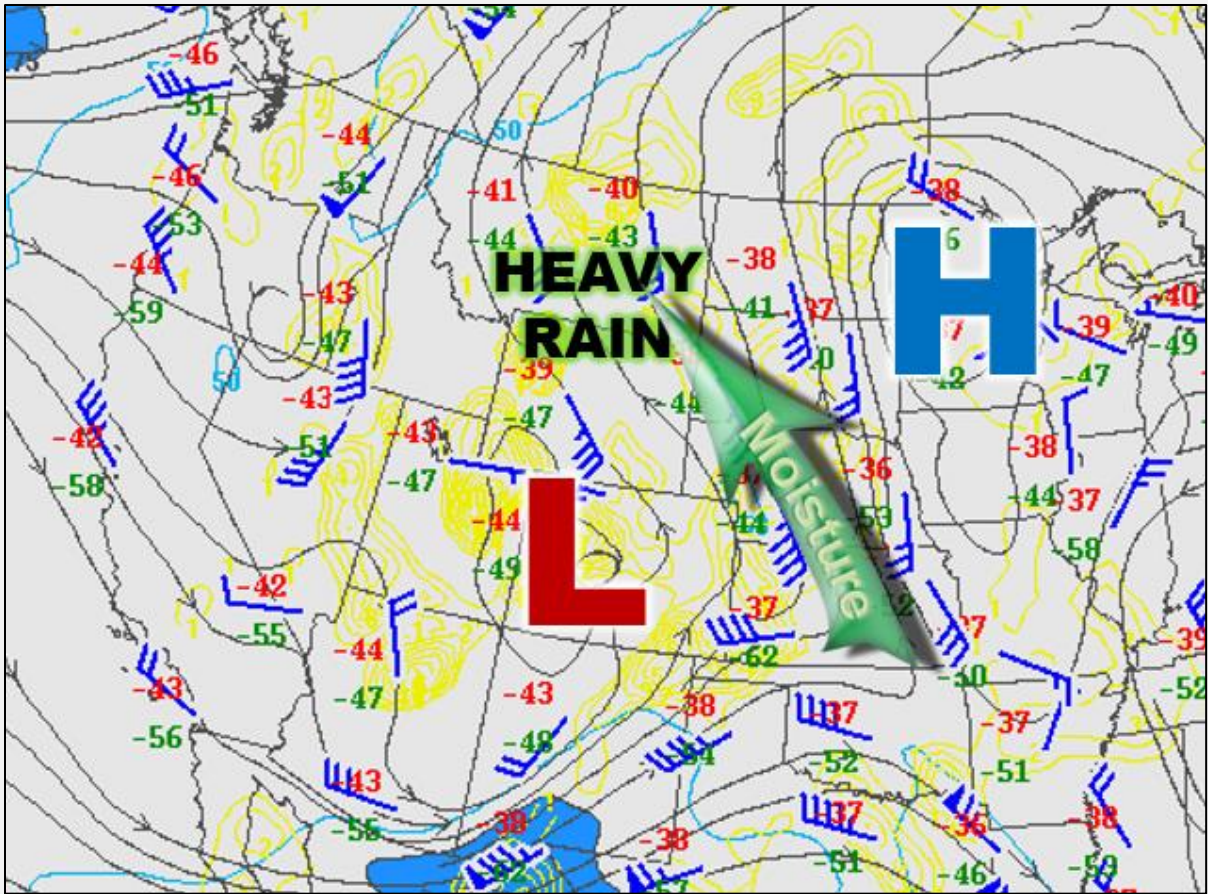
FLOODING IMPACTS: Flooding of low-lying and poor drainage areas, as well as some smaller streams, was common in areas of heaviest rainfall. Below is a summary of some of the greater impacts.

- **SOUTHEAST OF ROUNDUP:** During the evening of June 1st, a slow-moving thunderstorm produced 3 to as much as 5 ½ inches of rain in only 1-2 hours south of the Musselshell River and east of Highway 87. Several rural roads were washed out or damaged, and some residents were unable to access their home. Musselshell County declared a state of emergency due to the flash flooding.
- **BILLINGS-LAUREL AREA:** Persistent moderate to heavy rainfall caused widespread urban and low-land flooding from Laurel to Billings, especially by the night of the 2nd and morning of the 3rd. The Italian Ditch in Laurel was damaged, resulting in some home and business flooding. In Billings, residents reported water in basements, and many streets became flooded and impassable. The following roads in Billings were closed early on the 3rd.
 - Shiloh from King to Hesper
 - Gabel from 32nd to Zoo
 - Hesper from Shiloh to 32nd
 - Zimmerman Trail (due to rock falls)
 - Broadwater from 27th to 36th
 - Portions of Gabel Road
- **WEST OF RYEGATE:** Heavy rain from a thunderstorm near Hedgesville (estimated over 3" of rain in an hour) on June 1st caused localized flooding near the Wheatland-Golden Valley County line.

RAINFALL RECORDS: Billings Airport measured 2.19" of precipitation on June 2nd, setting a new daily record. This total also tied for the 12th wettest day since records began in 1934, and was the wettest day since 5/24/2011. Below are some 3-day totals and rankings at some of our official airport and cooperative observer stations.

SITE	3-DAY TOTAL RAINFALL	RANKING	PERIOD OF RECORD
Billings Airport	3.68 inches	3 rd wettest	1934-present
Billings NWS	4.43 inches	#1 wettest	1999-present
Billings Water Plant	4.22 inches	3 rd wettest	1894-present
Huntley	2.95 inches	5 th wettest	1911-present
Melville 4W	4.05 inches	6 th wettest	1960-present
Molt 6SW	3.90 inches	#1 wettest	2016-present

METEOROLOGY: The prolonged period of heavy rain was caused by a slow-moving upper-level low pressure system over the central Rockies, combined with a plume of deep moisture extending through the plains into eastern MT & WY, and easterly upslope winds. The air mass was also quite unstable. All these factors put us in a very favorable position to receive significant precipitation. Below is a map of upper level (300mb) winds on the morning of June 2nd, along with locations of the upper level low to our south and blocking high to the east. Also notice that the strongest winds aloft (i.e. location of the jet stream) was well to the south over southern AZ & NM, meaning the overall weather pattern in our region evolved very slowly.



PHOTOS: Here is a sampling of some photos we received. Thanks!

1. Number 4 Road near Roundup (Merison)
2. Molt Road Intersection (Billings Gazette)
3. East Parrot Road near Roundup (Merison)
4. Funnel cloud in Wheatland County (Pallas)
5. 29th Street & Broadwater in Billings (Ojeda)





