2019 Spring Flood Outlook
Lewis and Clark County

Arin Peters
Senior Service Hydrologist

Megan Syner
Warning Coordination Meteorologist

National Weather Service
02/28/2019

Building a Weather-Ready Nation
Predictive Services - Flooding

Deterministic River Forecasts
Deterministic River Forecasts

Latest observed value: 4.85 ft at 3:00 PM MDT 24-Jun-2018. Flood Stage is 6 ft
If you notice any errors in the below information, please contact our Webmaster

5.5  At 5.5 feet June 20 2018 - Flooding went out to Rossiter Elementary School. It took about 1 day for the water to get there. Parking lot on the north side of the school was filling with water. Some roads closed between Tenmile Creek and Sierra Road.

5  May 2018 - At 5.0 Feet, after several days of flooding, impacts increase around Sierra Road, (Over 2 miles away from Tenmile Creek.) Impacts increase significantly for each 0.1 inch of creek rise, as water runs downhill into the valley. Flooding as far north as 2 miles north of Sierra Rd on Montana Ave. Rainfall of 0.50 to 1.00 inches in the past 2 days as well. Pumps used by Rossiter School. Water transferred to trap club.

4.7  May 2018, At 4.7 feet flooding has spread out to Sierra Road. Sandbag the middle of Sierra Rd from MT Ave to I-15. Sandbag around Rossiter School. Flooding of Helena Campground and RV Park.

4.5  At 4.5 Feet - April 28 2018 - Flooding from Tenmile Creek starts to impact roads around Mill, Stadler, Edgerton Roads, McHugh Drive (1 mile north of creek). Some basements flood. Further east, water starts to come out of its bank near I-15. This was all from snowmelt - no rainfall. Temperature hit 85 degrees previous afternoon.

4.4  June 1 2018 - Water escaped in low lying areas along Tenmile Creek. Minor flooding around Mchugh, Mill, and Edgerton roads. Mostly from 1 inch of rain in the past day and some higher elevation snow melt as well.

4  Action Stage

3.9  April 2018 - Tenmile Creek came out of its bank at 3.9 feet on the west side of Helena at the Green Meadow Country Club.
Flood Prediction Challenges

Sparse precipitation and snowpack data

Ever-Changing River Geomorphology

Soil Moisture Uncertainties
Snow Water Equivalent

Modeled Snow Water Equivalent forecasted for 2019 February 26, 19:00 UTC

Inches of water equivalent:
- > 30
- 20 to 30
- 18 to 20
- 16 to 18
- 14 to 16
- 12 to 14
- 10 to 12
- 8 to 10
- 6 to 8
- 4 to 6
- 2 to 4
- 1 to 2
- trace to 1
- Not Estimated

Elevation in feet:
- > 13124
- 8203 to 13124
- 3281 to 8203
- 3 to 3281
- < 3
Percent of Normal Precipitation (%)
10/1/2018 – 2/25/2019

Generated 2/26/2019 at HPRCC using provisional data.
NOAA Regional Climate Centers
Snow Water Equivalent

Montana SNOTEL Current Snow Water Equivalent (SWE) % of Normal

Feb 28, 2019

Kootenai
Flathead
Sun, Teton, Marias
Lower Clark Fork
Upper Clark Fork
Jefferson
Bitterroot
St. Mary and Milk
Missouri-Mainemont
Smith, Judith, Musselshell
Gallatin
Madison

Current Snow Water Equivalent (SWE)
Basin-wide Percent of 1981-2010 Median

- unavailable *
- <50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- >= 150%

* Data unavailable at time of posting or measurement is not representative of this time of year

Provisional Data Subject to Revision

The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 09:00).
Snow Water Equivalent

Montana SNOTEL Current Snow Water Equivalent (SWE) % of Normal

Mar 15, 2018

Notice: We anticipate this map will not be available next year due to staffing constraints. Alternate maps: https://go.usa.gov/xnzxk

Provisional Data Subject to Revision

The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 05:00).

Prepared by: USDA- NRCS National Water and Climate Center
Portland, Oregon
http://www.wcc.nrcs.usda.gov
Snow Water Equivalent in MONTANA

Current as of 02/26/2019:
% of Median - 105%
% Median Peak - 84%
Days Until Median Peak - 44
Percentile - 52

Station List
- Median Peak SWE
- Max
- Median (POR)
- Median ('81-'10)
- Min
- Stats. Shading
  - 2019 (93 sites)
  - 2018 (91 sites)
  - 2017 (93 sites)
  - 2016 (93 sites)
  - 2015 (93 sites)
  - 2014 (92 sites)
  - 2013 (93 sites)
  - 2012 (93 sites)
  - 2011 (93 sites)
  - 2010 (93 sites)
  - 2009 (93 sites)
  - 2008 (92 sites)
  - 2007 (92 sites)

Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th Percentiles.
Canyon Ferry Reservoir

Archive Data From 1-OCT Through 30-SEP
Plotted 02/28/2019 08:21 (Provisional Data Subject to Revision)

Units: FBFT

Canyon Ferry Lake, Missouri River near Helena, MT

FB Reservoir Forebay Elevation (feet)

FB30AVG Last 30 Years Average Elevation (feet)
Two main waves of flooding risk:

- **March – April – (May?)**
  - Lowland flooding from snowmelt
  - Ice jams
  - Rain on snow

- **April – May – June**
  - Flooding due to mountain snowmelt and runoff
  - Flooding due to heavy rainfall
Best Case

- Gradual Warmup
  - Slow, gentle melting
- Minor Impacts
  - Mostly rural roads and fields
  - Ponding water in urban areas from clogged drainages

Worst Case

- Rapidly warming temps and overnight lows above freezing
  - Rapid snowmelt
  - Lowland and urban flooding
  - Difficult travel in rural areas due to washed out roads
- Heavy Rain (≥1”+ in 24 hours)
- Rain on snow at any elevation
What You Can Do

- Encourage those who live near streams or rivers to purchase flood insurance if they haven’t already (30 days for it to take effect)

- Sandbag availability

- Encourage residents to clear snow from drains and culverts near driveways

- Move equipment, hay or livestock in low-lying or areas prone to flooding to higher ground

- Call your local NWS office if you see any flooding or ice jams
Helpful Links

• https://www.weather.gov/tfx/dssriver

• https://water.weather.gov/ahps/region_forecast.php?state=mt

• https://www.wrh.noaa.gov/tfx/icejam/?wfo=tfx

• weather.gov/greatfalls

arin.peters@noaa.gov  406-727-7671
3 Month Outlook (MAM)

Three-Month Temperature Outlook
Mar Apr May 2019

Three-Month Precipitation Outlook
Mar Apr May 2019

Climate Prediction Center
Issued: 03/22/19
Coldest temps likely over North Central Montana Saturday and Sunday Night.

Coldest of the season for many.

Record cold-maximums possible.

Exposed skin can freeze in less than 10 minutes.

Limit time outdoors, travel with a safety kit, protect livestock.
Extreme Cold: This Fri-Tues

Forecast Daily Max Temp vs Departure for Feb 28-Mar 06, 2019

Great Falls Airport

Forecast Daily Max Temp vs Departure for Feb 28-Mar 06, 2019

Helena Airport

Forecast Daily Max Temp vs Departure for Feb 28-Mar 06, 2019

Bozeman Airport
Snow amounts will be lighter than earlier in the week.
weather.gov/greatfalls

Questions?