US Army Corps of Engineers
BUILDING STRONG

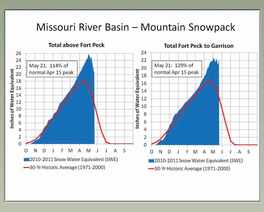
Missouri River
Mainstem Reservoir System

Spring 2011: May 21-31
Montana Rains: The Game Changer

Leading Up to the Flood

May 1: The Corps forecasts the annual runoff to be 44 million acre feet (MAF), considering already melted plains snow, still accumulating mountain snowpack and observed and forecasted above normal precipitation in the upper basin. The runoff total would be the 2nd highest runoff in 114 years, exceeded only in 1997 (49 MAF). Reservoir models indicate that the maximum releases out of Garrison Dam will hover near 49,000 cubic feet per second (cfs); for Gavins Point Dam, maximum releases are expected to be roughly 57,500 cfs.

May 10-11: Significant rain falls in eastern Montana with the total precipitation ranging from 2.5 to 3.5 inches.



Decision Timeline for Making Historic Releases

May 20

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U.S. ARMY CORPS OF ENGINEERS
NEWS RELEASE
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Corps plans further release increases out of Garrison Reservoir
Omaha, Neb. - The U.S. Army Corps of Engineers Water Management Division announced today that it plans to increase releases from Garrison Dam to 49,000 cubic feet per second (cfs).
"Inflows into the reservoir continue to exceed expected levels due to the much above normal precipitation over the past few weeks," said Jody Farhat, Chief of the Water Management Division here. "The expected runoff for the upper basin is now 44 million acre feet, which is the second highest runoff of record. The record was flood control zone, which extends from elevation 1850 feet to the top of the conservation pool at elevation 1854 feet. Releases from Garrison Dam will be increased from the current 41,000 cfs to 49,000 cfs. Additional increases may be necessary in the future."
In addition to the much above normal rainfall during May, mountain snowpack melt at a faster pace than is unseasonably cold temperatures. "If cooler temperatures do not persist, we typically see increased runoff from the mountain snowpack in June," said Farhat. "The increased releases will be necessary through a month sooner without the typical freeze-thaw pattern which allows more to soak in the ground."
Normally, the exceeded recreational peaks in mid-April, however this year it continued to accumulate into early May. The accepted protocol at 1% percent of normal is the need above Fort Peck and 129 percent above Garrison to begin releases on April 15.
The current release from Garrison is 41,000 cfs. It is scheduled to be increased to 49,000 cfs on Sunday and then held at that rate until Thursday to provide time for land owners to take appropriate measures to protect their property. The releases will then be increased to 56,000 cfs on Thursday, May 26 and to 65,000 cfs on Tuesday, May 31st. The projected releases are based on the 65,000 cfs. Additional increases may be necessary in the future, up to the full powerplant release capacity of 150,000 cfs.
"We recommend that folks prepare for an additional two-foot increase in river levels to accommodate the increased releases," said Farhat. "Residents should also be aware that releases could be increased on short notice to occur in the coming months," said Farhat. The increased releases will be necessary through the summer and into the fall to evacuate the near-record runoff. Short above normal releases are being considered for the fall to help refill the reservoir to the top of the flood control zone.
With all the generating units available, the release capacity at the powerplant is at 150 cfs. Currently, ongoing maintenance efforts are limiting the releases to 30,000 cfs through the power plant. The Corps is working to get the units back on-line by the end of June. Releases in excess of 30,000 cfs will be made through the regulatory tunnels, access to the wing walls will be closed for public safety.
-more-
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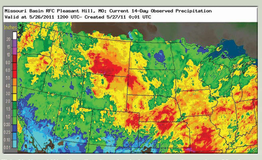
The Corps issues a press release to notify the public that reservoir releases out of Garrison will go to 60,000 cfs the following week and to 65,000 cfs by early June.

May 20-22

Between 5 and 8 inches of rain falls across the regions of eastern Montana, western South Dakota and northern Wyoming covering an area of 50 million acres.



This National Weather Service chart shows areas in western Montana, Wyoming and parts of Nebraska that received high precipitation over a 14 day span (May 12-26). Some parts of Montana received more than 15 inches of rain.

May 23

The Corps continues to assess the impact from the May 20-22 rain. River and reservoir models dictate a need to increase releases from all projects. Press release issues notice to the public that releases out of Garrison Dam will increase to 75,000 cfs and releases from Gavins Point Dam will go to 75,000 cfs in June, which is 5,000 cfs above the previous record release of 70,000 cfs during the 1997 flood.

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U.S. ARMY CORPS OF ENGINEERS
NEWS RELEASE
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Lots more water coming down the Missouri River - now!
Omaha, Neb. – Repeated rounds of heavy rain across Montana and the Dakotas, coupled with far above normal mountain snowpack, have pushed reservoirs to level which calls for aggressive water releases from Missouri River mainstem dams, said Jody Farhat, Chief of the Corps' Missouri River Basin Water Management Division in Omaha.
"The upper Missouri River is nearing dramatic increases in flows, particularly after as much as eight inches of rain fell over the weekend in portions of eastern Montana and western North Dakota," Farhat said. "Unusually heavy rain is also falling in the Dakotas. The Corps has been increasing releases in parts of the Missouri Basin, mainly as we will see a record runoff in the Missouri basin."
Farhat thinks it is possible that Garrison Dam may be within a foot of the top of its spillway gates by this time next week. Releases from Garrison Dam are currently 41,000 cubic feet per second (cfs). Releases from Gavins Point Dam will expect to be at the same time since the controlled threshold is setting for none of the same."
Garrison Dam releases were increased to 49,000 cubic feet per second (cfs) today and will be stepped up again to 56,000 cfs on May 26 and to 65,000 cfs on May 31. Releases from Gavins Point Dam are expected to be released from the current rate of 38,000 cfs to 75,000 cfs in July due to the rise of Garrison reservoir. Garrison Reservoir is expected to reach 1850 feet by this weekend due to the high flow on the Yellowstone and Little Missouri Rivers. The Corps has been releasing record releases from Garrison Dam for several months and the elevation exceeded. It is expected to rise 2 feet this week, reaching 1854 by the weekend.
Gavins Point releases will be boosted from 38,000 cfs today to 75,000 cfs by mid-week. Farhat explains the Gavins Point releases are necessary to evacuate space in the reservoir system for the large volumes of water that will be pushed by mid-to-late June. The record level at Gavins is 1210.7 feet, set in 1997 and exceeded in 1998. The peak pool level in 1997 was 0.3 feet lower at 1210.5.
"We are not expecting releases to be this high for long, but the river reach between Nebraska and Gavins Point is already at bankfull. Gavins Point releases were increased to 40,000 cfs this afternoon and will be slowly ramped up over the coming days, possibly reaching 75,000 cfs in June unless conditions improve. This will eventually immediate a smaller magnitude increase in Fort Randall's releases."
Farhat said that the Corps of Engineers' Omaha District and the Bismarck area is about 48 hours. River managers are expecting stages of approximately 18 ft to 17 feet in the Bismarck area when the river stabilizes. The Corps' Omaha District office has deployed technical teams to help prepare for flood fighting around Bismarck and to assess the flood potential in the Pierre area.
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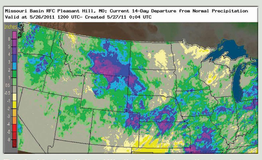
May 24

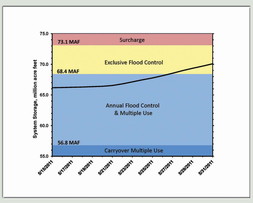
More field data (precipitation and river stages/flows) becomes available to the Corps from the National Weather Service (NWS) and U.S. Geological Survey, following the heavy rain on May 20-22. Soils previously saturated over the last several weeks contribute to record inflows of runoff entering the reservoir system. The Corps holds a teleconference call and issues a press release warning the public that releases out of Garrison Dam, Oahe and Gavins Point Dam will increase to 85,000 cfs.



This chart from the National Weather Service shows the departure from normal precipitation during the 14 day span (May 12-26). Areas in Montana, Wyoming, Nebraska, Colorado and Kansas received more than 8 inches above normal rainfall.

May 25

An additional 1.5 to 2 inches of rain falls in eastern Montana.



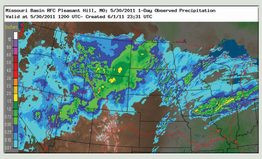
May 26

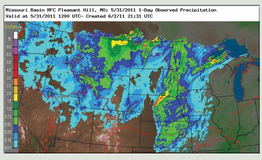
More runoff enters the system from the May 25 rains. The runoff from the additional rain forces the Corps to increase releases from 85,000. The Corps assesses the additional impact to the reservoirs and holds another call announcing that reservoir releases will reach 110,000 to 120,000 cfs at the lower five Mainstem dams. Releases out of Fort Peck, Mont. are projected to increase to 50,000 cfs. At right, water flows through the Fort Peck spillway June 4 at a rate of 30,000 cfs.

May 27

The NWS precipitation forecast indicates that more heavy rain (including 2 to 3 inches over the eastern half of Montana) is expected May 30-31.

The Corps hosts a teleconference call and issues a press release informing the public that reservoir releases from the lower five Mainstem dams will increase to 150,000 cfs; releases from Fort Peck will increase to 50,000 cfs.



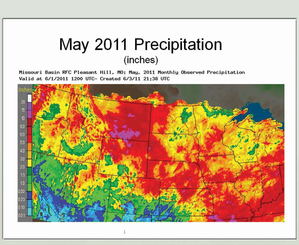
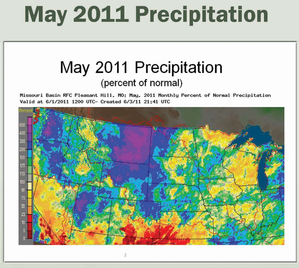
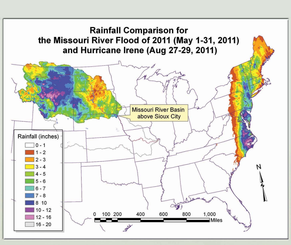


These charts from the National Weather Service shows areas in western Montana, Wyoming and parts of Nebraska that received precipitation on May 30 and 31.

May 30

On May 30, the Corps establishes the Missouri River Joint Information Center (MRJIC). The goal is to organize a central communications hub for basin communities to contact for accurate and timely information about the Corps' reservoir control and emergency response operations.

May 30-31

An additional 2 to 4 inches of rain falls in Montana.

May 2011 Precipitation