



(High Resolution Image)

National Hydrologic Assessment

Updated with Alaska Spring Ice Breakup information

Conditions are favorable for spring flooding over large sections of the United States, from the Northern Plains through the Midwest and eastward to New England.

A large swath of the North Central United States is at risk of moderate to major flooding this spring. Heavy late summer and autumn precipitation have left soils saturated and streams running high before the winter freeze-up. National Weather Service models show this year's snowpack contains a water content ranked among the highest of the last 60 years, which is similar to the past two years. This threat area extends from northeastern Montana through Wisconsin and along the Mississippi River south to St. Louis. For the third consecutive year, forecasters predict major flooding along the Red River of the North, which forms the state line between eastern North Dakota and northwest Minnesota. Other areas of the Midwest primed for major flooding include Devils Lake in North Dakota, the Milk River in Northeastern Montana, the James and Big Sioux Rivers in South Dakota, the Minnesota River, and the Mississippi River from its headwaters near St. Paul, Minnesota, downstream to St. Louis.

Recent heavy rains across the Ohio Valley have saturated soils and have rivers running high. With the forecast calling for above average precipitation during the next two weeks, the flood threat for this area has been raised to above average.

This spring, as flood waters drain from the Upper and Middle Mississippi and Ohio Rivers, the flood threat downstream to the Gulf of Mexico will increase. Despite dry conditions through much of the Gulf Coast over the winter, the Lower Mississippi River now has an above average risk of flooding. Recent rains across the Ohio Valley are adding an additional volume of water to the Mississippi River. The magnitude and extent of flooding will be determined by the timing of snowmelt and spring flooding from all contributing areas. Forecasters are continuously monitoring this situation.

Much of the Northeast has an above average risk of flooding with the highest risk in portions of lower New York, Eastern Pennsylvania and Northern New Jersey. This region experienced greater than average snowfall and/or river icing. With the spring melt underway and recent rainfall, rivers and streams are running higher, elevating the risk of flooding if heavy precipitation falls over these watersheds.

A below average risk of flooding exists in most of Texas, New Mexico, Louisiana and Florida. Precipitation and soil moisture deficits have led to extreme drought across southern extremes of these states. Please visit <http://www.drought.gov> for details.

Current Flooding

Heavy rainfall at any time can lead to flooding, even in areas where overall risk is considered below average. The information presented in this report focuses on spring flood potential, using evaluation methods analyzed on the scale of weeks to months, not days. Weather patterns change rapidly.

For the latest information specific to your area, including official watches and warnings, visit:

<http://water.weather.gov> or

<http://www.noaawatch.gov/floods.php>.

About this Product

The National Hydrologic Assessment is a report issued each spring by the NWS that provides an outlook on U.S. Spring flood potential, river ice jam flood potential, and water supply. Analysis of flood risk integrates late summer and fall precipitation, frost depth, soil saturation levels, stream flow levels, snowpack, temperatures and rate of snow melt. A network of 122 weather forecast offices and 13 river forecast centers nationwide assess this risk, summarized here at the national scale. The National Hydrologic Assessment depicts flood

risk on the scale of weeks to months over large areas, and is not intended to be used for any specific location. Moreover, this assessment displays river and overland flood threat. Flash flooding, which accounts for the majority of flood deaths, is a separate phenomena associated with weather patterns that are only predictable a few days in advance. To stay current on flood risk in your area, go to <http://water.weather.gov> for the latest local forecasts, warnings, and weather information 24 hours a day.

Above Average and High Flood Risk Areas

North Central U.S. and Upper Mississippi River

Heavy [late summer](#) and [autumn precipitation](#) (twice the normal amount since October in parts of North Dakota and Minnesota) had left [soils saturated](#) and streams running high before the winter freeze-up. NWS models show this year's snowpack contains a water content ranked among the [highest](#) of the last 60 years. The combination put a large portion of the North Central United States at risk of moderate to major flooding this spring, extending from northeastern Montana through western Wisconsin and along the Mississippi River south to St. Louis.

Information provided by NOAA on March 3, 2011 indicated Fargo, N.D. has a near 95 percent chance of exceeding major flood stage of 30 feet. At a stage of 30 feet, portions of downtown Fargo begin flooding and temporary dike construction is necessary. Approximately a 35 percent chance exists of reaching or exceeding the 40.8 foot record set in 2009. Grand Forks, N.D. has about a 95 percent chance of exceeding major flood stage of 46 feet. A series of storm systems are forecast to move across the region during the next two weeks, which could bring additional snow or rain on top of the remaining snowpack. These systems may cause substantial runoff and the beginning of minor flooding in the southern headwater portion of the Red River of the North, eventually leading to major flooding sometime from the last week of March through early April.

There is approximately a 25 percent chance of Devils Lake, ND exceeding 1,455 feet, which could partially inundate portions of the town of Minnewauken, including critical infrastructure and roads across the lake, emergency service routes and possibly a small section of the Amtrak train line.

There is potential for moderate to major flooding on the Milk River and its tributaries in northeastern Montana. The Milk River at Tampico (near Glasgow Montana) has about a 95 percent chance of exceeding the major flood stage of 27 feet. Some minor ice jam flooding is already occurring in Montana; additional major flooding resulting is expected this spring.

The James River at Huron, SD has about a 95 percent chance of exceeding major flood stage of 15 feet and a 25 percent chance of exceeding the record 21.2 foot level set in 1997. The Big Sioux River at Brookings, S.D., has a greater than 95 percent chance of exceeding major flood stage of 12 feet and about a 50 percent chance of exceeding the 14.77-foot record set in 1969. Warm temperatures in the forecast this week could cause much of the snowpack to melt across South Dakota, setting off moderate to major flooding in eastern South Dakota next week.

The Mississippi River is likely to see major flooding beginning in late March from its headwaters near St. Paul, Minnesota, downstream to St. Louis. St. Paul, MN has about a 95 percent chance of exceeding major flood stage of 17 feet, where secondary flood walls are deployed to protect the St. Paul Airport. Further downstream, there is a 75% chance (3 out of 4 chance) for major flooding on the Upper Mississippi River from Winona, MN, to Keokuk, IA. Most points from south of Keokuk to Winfield, MO (about 60 river miles upstream of St. Louis) have greater than a 50% chance of major flooding. Warm temperatures in the forecast this week could cause much of the snowpack to melt across southern Minnesota. Minor flooding could begin this week on the Mississippi River and its tributaries over southeastern Minnesota and southwestern Wisconsin, leading to moderate to major flooding by early April.

Citizens are encouraged to remain up-to-date on flood conditions by monitoring the latest forecasts from your local National Weather Service office.

Ohio River Valley

There is currently an above average risk of flooding in the Ohio River Valley, primarily in the Wabash and White river basins. [February rain and snowfall](#) was above normal with many portions of the region receiving over 200% of normal precipitation. Since March 1st, this region has received nearly [400% of normal precipitation](#) much of which has already caused flooding. As of March 17th, many NWS stream flow forecast points are in minor and moderate flooding and are projected to exceed moderate flooding through the spring. Stream and soil capacities to absorb additional water are limited; any additional precipitation this Spring will likely exacerbate flooding. As conditions continue to change, the latest river observations and forecasts are available on water.weather.gov.

Lower Mississippi River

This spring, as flood waters drain from the Upper and Middle Mississippi and Ohio Rivers, the flood threat downstream to the Gulf of Mexico will increase. Despite dry conditions through much of the Gulf Coast over the winter, the Lower Mississippi River now has an above average risk of flooding. Recent snowmelt and rains across the Ohio, Cumberland and Tennessee Rivers are currently producing moderate to major flooding on the Lower Ohio River and Mississippi River above Memphis, TN. Current flooding is mainly confined within the levee system and numerous roads and agricultural land are being directly impacted. Some homes and farmsteads near the river are being impacted in Lauderdale County, Tennessee. At this time, primarily agricultural flooding is expected south of Memphis, TN. The magnitude of future crests will depend on the amount and extent of any upstream accumulations of snow cover and resultant snowmelt; coupled, with the frequency, intensity and amount of Spring rains. Forecasters are continuously monitoring this situation.

Northeastern U.S.

Most of the Northeast has an above average risk of flooding as a result of [above average snowfall](#) this winter, followed by recent heavy rains. With the spring melt underway, and soils already saturated region-wide, any additional heavy rainfall will greatly elevate flood risk.

The highest risk of flooding is currently centered over lower New York State, Eastern Pennsylvania and Northern New Jersey, but other areas may be added to the list as future storm systems impact the area.

Below Average Flood Risk

A below average risk of flooding exists for Texas, New Mexico, Louisiana and Florida, where drought conditions persists. Please visit <http://www.drought.gov> for details.

It is important to remember that intense precipitation can overwhelm the ability of the soil to absorb excess water. Localized flash flooding during severe weather outbreaks is possible regardless of preceding conditions.

Texas, New Mexico, Louisiana

[Fall and winter precipitation](#) over Texas, New Mexico, and Louisiana was significantly below average, ranging from 20 to 75 percent of normal from October 2010 to mid-February 2011. Portions of the Pecos River and the Rio Grande basins received as little as 10% of normal rainfall. [Soil Moisture Analysis by the Climate Prediction Center](#) show drier than normal soils from the surface to as deep as 2 meters. This deficit will minimize the amount of water that can be converted to river flows during any rainstorm. Current [stream flow](#)

conditions as measured by the US Geological Survey range from below normal to much below average for stations across this region.

Florida

Fall and winter precipitation over Florida ranged from 50 to 75 percent of average for this period. Soil moisture is well below normal across the state. Deficits in the precipitation and soil moisture water contents translate into below average stream flow conditions for much of the region and a below average flood risk for the spring.

Western U.S. - Regarding Spring Flood Prediction

Mid-March is too early to determine spring flooding potential across the Western U.S. Snowpack remains above and much above average in many regions. There is still ample time left in the accumulation period for the spring flood potential to change. Weather conditions preceding and during the melt period determine the threat of flooding. Extremely high temperature can lead to elevated melt rates. During the melt, when rivers and streams are flowing at or near capacity, any precipitation can increase the risk of flooding. As always, citizens are encouraged to monitor the forecasts from their local Weather Forecast Offices.

Water Supply

Current water supply forecasts and outlooks in the western United States are for above average snow melt runoff volumes for most basins:

- **Colorado River** - Median forecast inflow to Lake Powell is 113% of average
- **Columbia and Snake Rivers** - Median forecast at the Dalles is 103% of average
- **Missouri River** - Median forecast at Toston is 105% of average
- **California** - Median forecasts range from 95% to near 150% of average

Exceptions to the average and above average outlooks are the Lower Colorado River and the Upper Rio Grande where forecasts are for below normal runoff.

The above normal forecasts reflect the very active series of storms that affected much of the western United States in the second half of December 2010 and the second half of February 2011. This series of storms produced significant mountain snow accumulations over most of the western United States. In many cases snow water equivalent readings are already at or near their average annual peak values with another 1-3 months of accumulation possible. The latest water supply forecasts are available here:

<http://wateroutlook.nwrfc.noaa.gov/maps/wsf>

Water supply forecasts are produced for mountainous basins in the western United States that supply water for agriculture, municipalities, and industrial uses. Forecasts reflect current hydrologic conditions including snow pack, soil moisture, and weather and climate outlooks. As these conditions change, especially over the next couple months, forecasts will be updated to reflect these changes. Water supply forecasts are collaboratively generated by NOAA/NWS River Forecast Centers and the NRCS National Water and Climate Center.

Alaska Spring Ice Breakup Outlook

The flood potential from snowmelt and ice jams throughout Alaska this Spring is currently rated as above average. This forecast is based on current ice thickness, observed snowpack, and long range weather forecasts.

Ice Thickness

March 1st measurements indicate ice is slightly thicker than normal on the Kuskokwim and Yukon Rivers and thinner than normal on the Tanana River and on the North Slope. The Gerona River in the Copper River basin has accumulated a significant amount of aufeis (a sheet-like mass of layered ice that forms from successive flows of ground water during freezing temperatures) near the highway at Gerona junction and is at a greater risk of flooding than normal. Also, an abnormal fall ice breakup event on the Kuskokwim River in November left stretches of jumbled breakup ice that refroze. This may affect the breakup process and cause additional ice jams during the spring breakup. Accumulated freezing degree days are near normal values over most of Alaska.

Snowpack

An analysis of the March 1st snowpack by the Natural Resources Conservation Service (NRCS) indicates a higher to much higher than normal snowpack in northwest Alaska. This may significantly increase the risk of breakup related flooding in these areas depending on weather patterns over the next 6-8 weeks. There is currently a below normal snowpack throughout much of Southwest and South-central Alaska. However, the snowpack is sufficient in these areas to produce significant snowmelt runoff peaks and potential flooding if subjected to a rapid warming pattern. For more details, please refer to the various snow graphics available at <http://aprfc.arh.noaa.gov> or from the NRCS at <http://ambsc.org> (select snowpack reports or snowpack maps).

Weather Forecasts

The weather outlook for the remainder of March is for near normal temperatures and precipitation over most of the state with the Northwest coast having an increased chance of below normal temperatures and above normal precipitation. The most important factor determining the severity of ice breakup remains the weather during April and May. The 90 day outlook for the months of April, May and June indicates that the probability of below normal temperatures over the southern third of the state will be greater, while the rest of the state has equal chance of below, normal or above normal temperatures. For more information on the climate forecasts please refer to the Climate Prediction Center at <http://www.cpc.ncep.noaa.gov/index.php>

Please visit the Alaska-Pacific River Forecast Center for the latest [Spring Breakup Outlook](#).

NOAA's Role in Flood Awareness and Public Safety

To help people and communities prepare, NOAA offers the following flood safety tips:

- Determine whether your community is in a flood-risk area and continue monitoring local flood conditions at <http://water.weather.gov>.
- Visit <http://www.floodsmart.gov> to learn about FEMA's National Flood Insurance Program and for flood preparedness advice to safeguard your family, home and possessions.
- Purchase a [NOAA Weather Radio](#) receiver with battery power option to stay apprised of quickly

changing weather information.

- Study evacuation routes in advance and heed evacuation orders.
- [Turn Around, Don't Drown](#) – never cross flooded roads, no matter how well you know the area or how shallow you believe the water to be.

NOAA's National Weather Service is the primary source of weather data, forecasts and warnings for the United States and its territories. It operates the most advanced weather and flood warning and forecast system in the world, helping to protect lives and property and enhance the national economy. Visit us [online](#) and on [Facebook](#).

NOAA's mission is to understand and predict changes in the Earth's environment, from the depths of the ocean to the surface of the sun, and to conserve and manage our coastal and marine resources. Visit us [online](#) or on [Facebook](#).

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