



Red River and Devils Lake Basins - 2023 Spring Flood Outlook

NWS Grand Forks • North Central River Forecast Center • March 23, 2023

This outlook is based on observed conditions through Monday, March 20th and includes forecast precipitation through Monday, March 26th. Visit our website at [weather.gov/fgf/currentfloodoutlook](https://www.weather.gov/fgf/currentfloodoutlook) for associated exceedance graphics, probabilities, and related discussions. This will be the last probabilistic spring flood outlook for 2023.

Key Message: The risk for significant (moderate or higher) flooding has increased since the last outlook (now generally above long-term historical averages for most of the Red River Basin) due to additional snowfall and delayed melt conditions.

Key Points:

- Moderate to major spring flooding is depicted in this outlook (50% exceedance probability) for the mainstem Red River and southeastern North Dakota tributaries. Minor to isolated moderate flooding (50% exceedance probability) is depicted for some of the Minnesota tributaries.

- Below normal soil moisture and near normal streamflows entering into freeze-up.

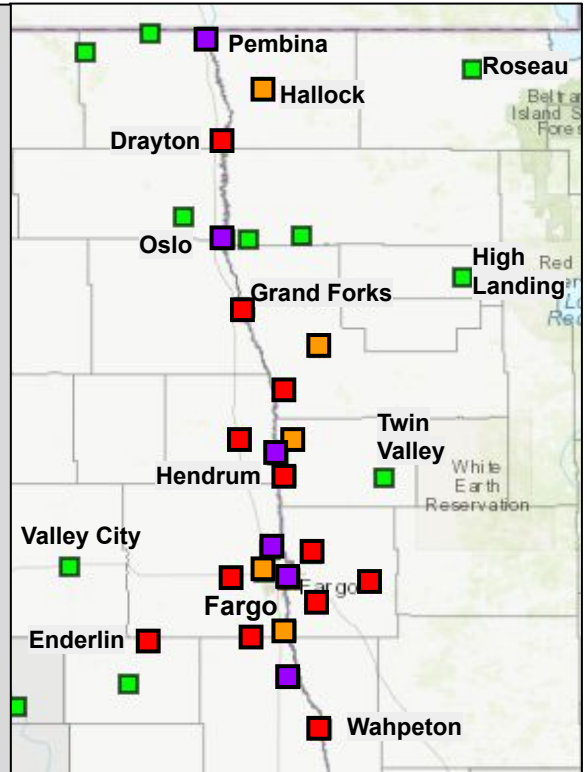
- Above normal snowfall and precipitation through winter and spring so far (with the exception of the far northern basin).

- The continuation of below normal temperatures is leading to a delayed melt.

- Snowmelt timing/thaw cycle, along with any additional snow and/or rain, will be the most important factors contributing to the spring flood risk.

Flood Risk Indicated as > 50% of category:

- Major
- Moderate
- Minor
- < 50%



Valid March 27, 2023 - June 25, 2023

Snowmelt Flood Components:

1. Fall Precipitation and Soil Moisture at Freeze-up: Below normal. Fall precipitation (Sep-Nov 2022) was below normal across the basin. Conditions were driest across the lower Sheyenne basin and southern Red River Valley (3-4 inches below normal); elsewhere was 1-2 inches below normal. Soil moisture heading into freeze-up was lower than normal with moderate drought conditions persisting across southern central portions of the basin and abnormally dry conditions across the north.

2. Base Streamflow: Near normal. USGS analyses indicate that the Red River mainstem and its tributaries were flowing at normal ranges heading into freeze-up.

3. Frost Depth: Near normal to deeper than normal. Frost depth values have started to level off for the season and remain deepest across northeastern ND (30-40 inches) while shallower and more variable across southeastern ND and much of the MN portion of the basin (20-30 inches).

4. Snowpack and Associated Water Content: Normal to above normal. After a wet and snowy beginning to winter, January and early February brought less than normal snowfall/precipitation across to the basin. A more active pattern returned for the second half of February and continued into March. Total snowfall is above normal for most areas, especially across the Devils Lake and Sheyenne basins (~30-40 inches above normal). Associated water content ranges from around 2.0 inches across the far northern basin to 4.0 to 6.0+ inches across the remainder of the basin.

5. Future Conditions: Below normal temperatures to continue through the end of March with near normal precipitation (normal high temperatures for late March into mid-April range from the upper 30s to low 50s). Climate outlooks indicate below normal temperatures continuing into April with no strong signal either way for above, below, or near normal precipitation.

DEVILS LAKE AND STUMP LAKE

Valid March 20, 2023 - September 30, 2023

| DEVILS LAKE | 95% | 90% | 75% | 50% | 25% | 10% | 5% |
|--------------------|--------|--------|--------|--------|--------|--------|--------|
| Creel Bay | 1449.9 | 1450.0 | 1450.1 | 1450.4 | 1450.7 | 1451.0 | 1451.6 |
| Eastern Stump Lake | 1449.9 | 1450.0 | 1450.1 | 1450.4 | 1450.7 | 1451.0 | 1451.6 |

Devils Lake and Stump Lake are currently at ~1449.4 ft (zero datum 1400.00 NGVD29).

RED RIVER AND TRIBUTARIES

Valid March 27, 2023 - June 25, 2023

| RED RIVER MAINSTEM | 95% | 90% | 75% | 50% | 25% | 10% | 5% |
|--------------------|------|------|------|------|------|------|------|
| Wahpeton | 11.9 | 12.1 | 13.1 | 14.3 | 15.3 | 16.4 | 16.8 |
| Hickson | 27.5 | 28.1 | 30.4 | 32.6 | 34.0 | 35.4 | 36.3 |
| Fargo | 29.5 | 30.7 | 32.7 | 34.2 | 36.4 | 37.8 | 38.6 |
| Halstad | 32.5 | 33.7 | 35.7 | 38.2 | 39.5 | 39.9 | 40.2 |
| Grand Forks | 41.0 | 41.8 | 42.9 | 44.4 | 46.5 | 49.2 | 50.0 |
| Oslo | 35.0 | 35.3 | 35.7 | 36.3 | 37.3 | 38.4 | 38.7 |
| Drayton | 38.6 | 39.5 | 40.1 | 40.8 | 41.8 | 42.9 | 43.5 |
| Pembina | 45.6 | 46.8 | 47.7 | 49.6 | 50.9 | 52.3 | 52.8 |

| MINNESOTA TRIBUTARIES | 95% | 90% | 75% | 50% | 25% | 10% | 5% |
|--------------------------|-------|-------|-------|-------|-------|-------|-------|
| South Fork Buffalo River | | | | | | | |
| Sabin | 14.0 | 14.4 | 14.8 | 15.3 | 15.8 | 16.4 | 16.8 |
| Buffalo River | | | | | | | |
| Hawley | 8.2 | 8.7 | 9.1 | 9.8 | 10.3 | 10.8 | 11.2 |
| Dilworth | 19.3 | 19.8 | 20.6 | 21.6 | 22.5 | 23.3 | 23.9 |
| Wild Rice River | | | | | | | |
| Twin Valley | 6.8 | 7.2 | 7.8 | 8.9 | 9.6 | 11.0 | 11.9 |
| Hendrum | 26.7 | 28.1 | 29.1 | 30.5 | 31.7 | 32.5 | 33.1 |
| Marsh River | | | | | | | |
| Shelly | 10.9 | 12.4 | 13.5 | 15.1 | 17.3 | 19.5 | 20.2 |
| Sand Hill River | | | | | | | |
| Climax | 19.9 | 20.7 | 22.7 | 24.9 | 28.3 | 30.7 | 32.1 |
| Red Lake River | | | | | | | |
| High Landing | 7.0 | 7.3 | 8.3 | 9.3 | 9.5 | 11.4 | 11.8 |
| Crookston | 13.8 | 14.2 | 15.7 | 17.9 | 20.1 | 22.4 | 23.5 |
| Snake River | | | | | | | |
| Above Warren | 63.4 | 63.7 | 64.1 | 64.9 | 65.7 | 67.3 | 68.1 |
| Alvarado | 100.1 | 100.8 | 102.0 | 103.5 | 105.6 | 108.1 | 108.6 |
| Two Rivers River | | | | | | | |
| Hallock | 800.3 | 800.6 | 802.0 | 804.1 | 807.1 | 808.3 | 809.0 |
| Roseau River | | | | | | | |
| Roseau | 8.0 | 8.5 | 9.3 | 10.6 | 13.2 | 15.6 | 17.0 |

Legend:
 Below Flood Stage
 Minor
 Moderate
 Major
 Flood of Record

| NORTH DAKOTA TRIBUTARIES | 95% | 90% | 75% | 50% | 25% | 10% | 5% |
|--------------------------|------|------|------|------|------|------|------|
| Wild Rice River | | | | | | | |
| Abercrombie | 15.7 | 16.1 | 17.5 | 19.2 | 21.8 | 24.0 | 25.0 |
| Sheyenne River | | | | | | | |
| Valley City | 11.6 | 12.0 | 12.6 | 13.3 | 14.3 | 18.0 | 19.5 |
| Lisbon | 12.0 | 12.6 | 13.2 | 13.9 | 15.2 | 18.5 | 20.1 |
| Kindred | 16.8 | 17.2 | 18.3 | 19.6 | 20.5 | 21.2 | 21.2 |
| West Fargo Diversion | 16.5 | 17.2 | 17.6 | 19.3 | 21.3 | 21.3 | 21.3 |
| Harwood | 89.3 | 90.1 | 91.1 | 91.5 | 91.8 | 92.1 | 92.2 |
| Maple River | | | | | | | |
| Enderlin | 11.4 | 11.6 | 12.3 | 12.9 | 13.2 | 13.8 | 14.2 |
| Mapleton | 21.0 | 21.6 | 22.0 | 22.4 | 22.8 | 23.2 | 23.7 |
| Goose River | | | | | | | |
| Hillsboro | 9.8 | 11.6 | 13.0 | 13.9 | 14.4 | 15.1 | 15.6 |
| Forest River | | | | | | | |
| Minto | 4.3 | 4.6 | 5.2 | 5.7 | 6.5 | 7.1 | 7.2 |
| Pembina River | | | | | | | |
| Walhalla | 5.4 | 5.7 | 6.2 | 6.9 | 8.3 | 10.4 | 11.3 |
| Neche | 9.1 | 9.8 | 11.3 | 12.7 | 16.7 | 19.6 | 20.5 |