



Red River and Devils Lake Basin - 2020 Spring Flood Outlook

Discussion Points 2/27/2020

prepared by

NWS - Weather Forecast Office, Grand Forks ND
NWS - North Central River Forecast Center, Chanhassen MN



This outlook is for the U.S. portion of the basin and is based on conditions through Monday, 2/24/2020. All graphics, probabilities, and related discussions are available at weather.gov/fgf. The next update will be issued by 3/12/2020.

Bottom Line up Front!

- **Good News: Flood Risk at all forecast points has been reduced slightly since mid-January.**

-- **No big late Jan or Feb storms:** Snowfall has been below normal since mid-January.

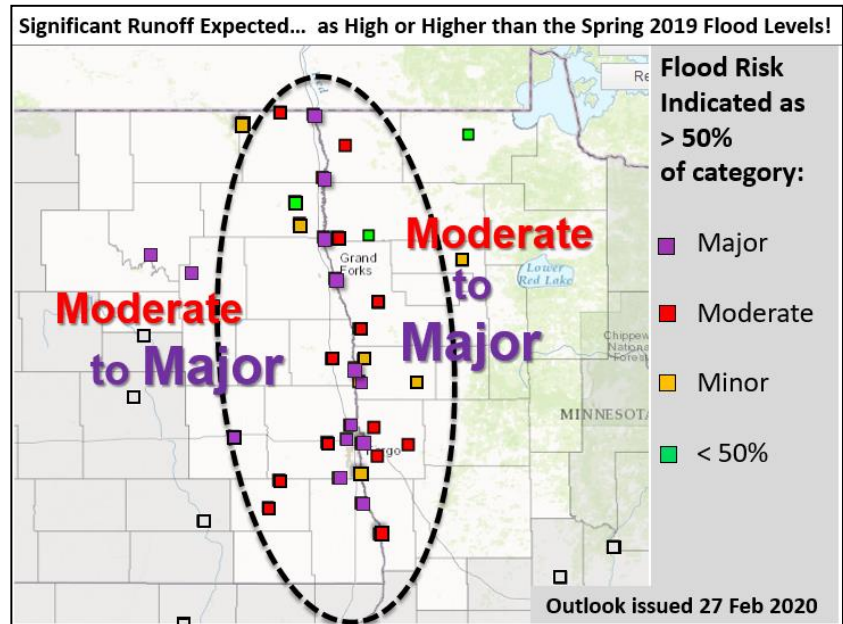
-- **Generally mild conditions:** Frost depths are still shallow and quite variable.

- **Bad News: But not very much of a risk reduction since January 23rd outlook.**

-- **Very wet soils and high base streamflows persist.**

-- **Snowpack/SWE still remains at or above normal leading to high runoff potential.**

- **Good News: Climate outlooks have no clear signal: wet, dry, or normal.** No longer indicate the risk for a cooler and wetter late winter and early spring period - **thus March will likely be a big risk factor, as it always is.**



Long Story Short: The risk for significant snowmelt flooding continues to be substantial, running above long-term averages across the Red River and Devils Lake Basins (U.S. portions), but it has dropped a bit.

Key Snowmelt Flood Components: (slight reduction due to recent dry period - little change since Jan 23, 2020 outlook)

1. Base Streamflow: At or near record high levels for this time of year. USGS analyses indicate that the Red River and most of its ND and MN tributaries (south of Grafton-Argyle) are moderate-thin ice covered and/or flowing at 95th percentiles or greater [link: <https://waterdata.usgs.gov/nwis/rt>]. Tributaries north of Grafton-Argyle are at 76% to 95%.

2. Soil Moisture at Freeze-up: Much above normal throughout. Standing water frozen into some ditches.

[Link: https://www.cpc.ncep.noaa.gov/products/Soilmst_Monitoring/US/Soilmst/Soilmst.shtml]

3. Frost Depth: Shallower than normal. Heavy snowcover most of the season has kept frost depths somewhat shallow across the far southern RRV at 6-12 inches. Frost at most locations north of Fargo is 10 to 30 inches deep. Lake/river ice thicknesses are less than normal and quite variable. [Link: https://www.weather.gov/ncrfc/LMI_FrostDepthMap]

4. Winter Snowpack/SWE: Still above normal. Since December 1st, snowfall has been running 125-275 percent of normal with SWE still ranging from 2.5 to 5.0 inches - least across far northeast ND and far northwest MN. [Link: <https://www.nohrsc.noaa.gov/nsa/>]

5. Precipitation: Sep 1st to Feb 24th still a record high. Total precipitation (rain and snow-water) measured across the basin from Sep 1st through Feb 24th was 4-8 inches above the long-term normal for most of Red River Basin. [Links: <https://www.ncdc.noaa.gov/sotc/national/201913>; https://water.weather.gov/precip/index.php?location_type=wfo&location_name=FGF]

New! Along with our flood partners, we've developed a display graphic which relates the current flood outlook to our historical flood levels, now available for all our forecast locations! **Check it out at:** <https://www.weather.gov/fgf/PFOS>

DEVILS LAKE & STUMP LAKE... Long-Range Probabilistic Outlook
Valid February 24, 2020 - September 30, 2020

| LOCATION | 95% | 90% | 75% | 50% | 25% | 10% | 05% |
|-----------------|--------|--------|--------|--------|--------|--------|--------|
| CREEL BAY | 1450.6 | 1450.7 | 1450.9 | 1451.2 | 1451.8 | 1452.4 | 1453.1 |
| EAST STUMP LAKE | 1450.6 | 1450.7 | 1450.9 | 1451.2 | 1451.8 | 1452.4 | 1453.1 |

The current heights of Devils Lake and Stump Lake are ~1448.95 ft MSL.

Color code: Below Minor Moderate Major Flood of Record

RED RIVER AND TRIBUTARIES... Long-Range Probabilistic Outlook
Valid March 2, 2020 - May 31, 2020

| LOCATION | 95% | 90% | 75% | 50% | 25% | 10% | 05% |
|-------------|------|------|------|------|------|------|------|
| WAHPETON | 12.0 | 12.3 | 12.7 | 13.8 | 15.5 | 16.6 | 17.1 |
| HICKSON | 27.6 | 28.1 | 29.3 | 32.2 | 34.0 | 35.5 | 36.1 |
| FARGO | 32.0 | 32.5 | 33.7 | 34.8 | 36.2 | 38.5 | 39.1 |
| HALSTAD | 36.3 | 37.1 | 38.3 | 38.8 | 39.4 | 39.9 | 40.3 |
| GRAND FORKS | 45.1 | 45.6 | 47.1 | 48.2 | 50.2 | 52.2 | 53.3 |
| OSLO | 37.1 | 37.2 | 37.4 | 37.7 | 37.9 | 38.0 | 38.0 |
| DRAYTON | 41.5 | 41.9 | 42.5 | 43.0 | 43.7 | 44.6 | 45.2 |
| PEMBINA | 50.9 | 51.7 | 52.2 | 52.7 | 53.6 | 54.0 | 54.6 |

Minnesota Tributaries:

| | | | | | | | |
|-------------------------------|-------|-------|-------|-------|-------|-------|-------|
| South Fork Buffalo River..... | | | | | | | |
| SABIN | 15.4 | 15.8 | 16.1 | 16.7 | 17.6 | 18.4 | 19.2 |
| Buffalo River..... | | | | | | | |
| HAWLEY | 8.6 | 9.0 | 9.4 | 9.8 | 10.4 | 10.9 | 11.2 |
| DILWORTH | 21.6 | 22.1 | 22.7 | 23.5 | 24.2 | 25.3 | 26.2 |
| Wild Rice River..... | | | | | | | |
| TWIN VALLEY | 9.9 | 10.1 | 10.7 | 11.7 | 12.8 | 13.6 | 15.0 |
| HENDRUM | 29.7 | 30.5 | 31.7 | 32.1 | 32.6 | 33.3 | 33.9 |
| Marsh River..... | | | | | | | |
| SHELLY | 15.1 | 16.3 | 17.5 | 18.7 | 20.3 | 21.8 | 22.9 |
| Sand Hill River..... | | | | | | | |
| CLIMAX | 24.3 | 25.9 | 28.3 | 29.8 | 32.0 | 34.0 | 35.7 |
| Red Lake River..... | | | | | | | |
| HIGH LANDING | 9.7 | 10.5 | 11.5 | 12.2 | 13.0 | 13.2 | 13.4 |
| CROOKSTON | 19.5 | 20.4 | 21.3 | 22.8 | 24.8 | 26.8 | 28.0 |
| Snake River..... | | | | | | | |
| ABOVE WARREN | 65.4 | 65.4 | 65.9 | 66.6 | 67.7 | 69.7 | 70.8 |
| ALVARADO | 105.5 | 105.8 | 106.9 | 108.4 | 109.3 | 110.0 | 110.5 |
| Two Rivers River..... | | | | | | | |
| HALLOCK | 804.9 | 805.8 | 806.5 | 807.5 | 808.2 | 809.2 | 809.8 |
| Roseau River..... | | | | | | | |
| ROSEAU | 13.3 | 13.9 | 14.9 | 15.5 | 17.7 | 18.3 | 18.5 |

North Dakota Tributaries:

| | | | | | | | |
|----------------------|------|------|------|------|------|------|------|
| Wild Rice River..... | | | | | | | |
| ABERCROMBIE | 19.9 | 20.4 | 21.4 | 22.8 | 23.9 | 26.1 | 26.8 |
| Sheyenne River..... | | | | | | | |
| VALLEY CITY | 14.2 | 15.1 | 16.5 | 17.9 | 20.8 | 22.4 | 26.8 |
| LISBON | 16.1 | 16.5 | 17.1 | 18.2 | 21.1 | 23.5 | 29.4 |
| KINDRED | 20.3 | 20.4 | 20.6 | 21.0 | 21.2 | 21.2 | 21.2 |
| WEST FARGO DVRSN | 21.3 | 21.3 | 21.3 | 21.3 | 21.3 | 21.2 | 21.3 |
| HARWOOD | 91.4 | 91.4 | 91.7 | 91.8 | 92.0 | 92.2 | 92.3 |
| Maple River..... | | | | | | | |
| ENDERLIN | 12.0 | 12.1 | 12.4 | 12.9 | 13.4 | 13.9 | 14.5 |
| MAPLETON | 22.0 | 22.1 | 22.4 | 22.6 | 23.0 | 23.6 | 24.0 |
| Goose River..... | | | | | | | |
| HILLSBORO | 11.7 | 12.1 | 13.1 | 14.0 | 14.4 | 15.3 | 16.8 |
| Forest River..... | | | | | | | |
| MINTO | 4.8 | 5.1 | 5.6 | 6.2 | 6.8 | 8.0 | 8.5 |
| Park River..... | | | | | | | |
| GRAFTON* | 10.0 | 10.1 | 10.5 | 10.9 | 12.1 | 13.9 | 15.2 |
| Pembina River..... | | | | | | | |
| WALHALLA | 9.0 | 9.3 | 10.1 | 11.1 | 12.6 | 14.2 | 15.3 |
| NECHE | 16.6 | 17.0 | 18.4 | 20.0 | 21.1 | 21.4 | 21.5 |

Notes:

(no significant changes since Jan 23rd or Feb 12th outlooks)

1. Devils Lake Basin runoff risk is quite high. A rise of 2 to 3 ft is expected (75% to 25% risk range). A 0.5 to 1 ft rise on Devils Lake is considered about normal.

Note: Devils Lake is currently about a foot higher than this time last year.

2. Red River Basin runoff risk is overall quite high. All Red River mainstem points will see significantly high flows.

- heavily influenced by excess flow and soil moisture now.

- coupled with high winter snowpack and SWE.

- exacerbated by a potentially delayed thaw cycle.

3. Above normal snowpack and runoff potential is evident in most all MN tributaries.

The northern-most MN tribs have the wettest soils but a somewhat lesser snowpack.

4. ND Wild Rice, Sheyenne, and Maple Rivers are at a much higher runoff risk.

Mid and Upper Sheyenne is carrying substantial soil moisture and snowpack with potential for both early and later crest issues.

Lower Sheyenne through east-central ND tribs are also at an exceptionally elevated risk.

Northeast ND threat is mixed, with lesser runoff at the upper basins of the Pembina, Forest, and Park Rivers.

Note: Reduced risk expected for areas protected by new Grafton Bypass!