



Red River and Devils Lake Basin - 2021 Spring Flood Outlook

Discussion Points 2/11/2021

prepared by

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This outlook is for the U.S. portion of the basin and is based on conditions through Tuesday, 2/09/2021. All graphics, probabilities, and related discussions are available at [weather.gov/fgf](https://www.weather.gov/fgf). The next update will be issued by 2/25/2021.

Bottom Line up Front!

- Its well past mid-winter... and there's *still* a very low threat for *significant* snowmelt flooding, similar to spring 2018.

- Its now *quite* Cold and Dry:

- Abnormally Dry to Moderate Drought conditions underlay a meager snowpack.

- Snowfall/SWE through early February is well below long term winter season normal amounts.

- Frost depths are digging deep, as cold air and meager snowpack has allowed for deeper frost penetration.

- A turnaround from record wettest year in 2019, and Top Ten flooding in 2020.

But, a dry late summer and fall period in 2020 has depleted any residual soil moisture or streamflow.

- Climate outlooks currently indicate an increased risk for near normal temperatures but a somewhat wetter late winter early spring period, which increases our risk for late season heavy snow or rainfall.

Long Story Short: The risk for significant snowmelt flooding is quite low, running below long-term historical averages across the Red River and Devils Lake Basins (U.S. portions).

Key Snowmelt Flood Components:

1. Base Streamflow: Near to somewhat below average 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 ice covered and/or flowing at in the 25% -75% of normal ranges [link: <https://waterdata.usgs.gov/nwis/rt/>]. Tributaries north of Grafton-Argyle at 25%.

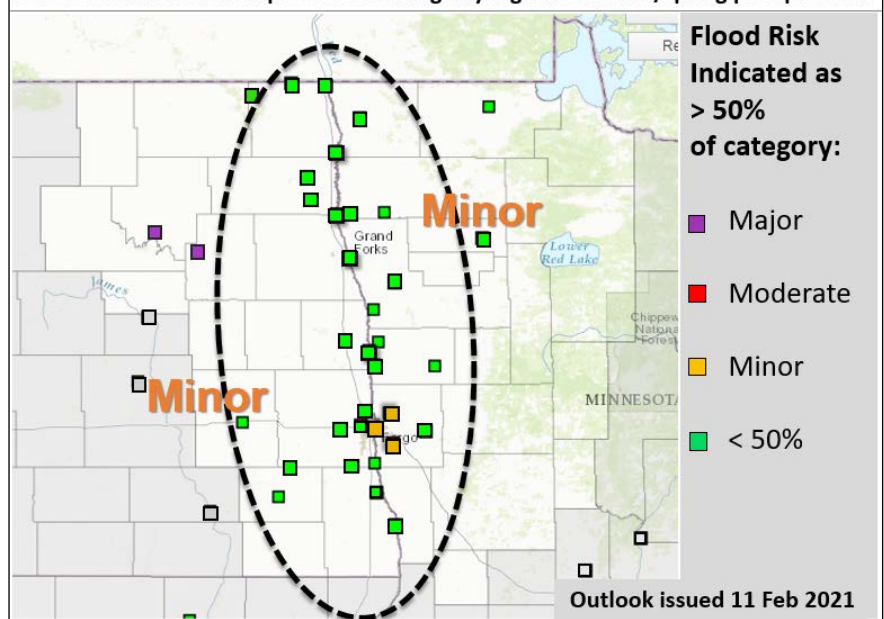
2. Soil Moisture at Freeze-up: Near to below average across the Red River Basin, and well below average in the Devils Lake Basin. [Link: https://www.cpc.ncep.noaa.gov/products/Soilmst_Monitoring/US/Soilmst/Soilmst.shtml]

3. Frost Depth: Deeper than normal. A mild early winter but with a very light and/or delayed snowcover has allowed for deep frost penetration in most areas. Frost depths range from 18 to 32 inches in most locations, with some lesser frost depths in upland areas on northwest MN, where snowpack was slightly higher. Lake/River ice thicknesses are somewhat less-than normal and are quite variable. [Link: https://www.weather.gov/ncrfc/LMI_FrostDepthMap]

4. Winter Snowpack/SWE: Below normal. Since Dec 1st, snowfall runs from 25-75 percent of normal, SWE ranges from Trace to 2.0 inches - least across far eastern ND and the central-northern Red River Corridor. Highest in northcentral MN. [Link: <https://www.nohrsc.noaa.gov/nsa/>]

5. 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>

Below Normal Runoff Expected... barring any high late winter/spring precipitation!



DEVILS LAKE & STUMP LAKE... Long-Range Probabilistic Outlook
Valid February 8, 2021 - September 30, 2021

| LOCATION | 95% | 90% | 75% | 50% | 25% | 10% | 05% |
|-----------------|--------|--------|--------|--------|--------|--------|--------|
| CREEL BAY | 1448.7 | 1448.7 | 1448.8 | 1448.9 | 1449.0 | 1449.3 | 1449.6 |
| EAST STUMP LAKE | 1448.7 | 1448.7 | 1448.8 | 1448.9 | 1449.0 | 1449.3 | 1449.6 |

The current heights of Devils Lake and Stump Lake are ~1448.57 ft. MSL.

Color code: Below Minor Moderate Major Flood of Record

RED RIVER AND TRIBUTARIES... Long-Range Probabilistic Outlook
Valid February 15, 2021 - May 16, 2021

| LOCATION | 95% | 90% | 75% | 50% | 25% | 10% | 05% |
|-------------|------|------|------|------|------|------|------|
| WAHPETON | 8.3 | 9.0 | 10.0 | 10.9 | 12.1 | 13.8 | 14.2 |
| HICKSON | 15.6 | 18.3 | 20.4 | 22.9 | 26.5 | 30.8 | 32.1 |
| FARGO | 16.8 | 17.2 | 18.7 | 20.5 | 24.7 | 31.5 | 33.3 |
| HALSTAD | 11.0 | 12.4 | 14.7 | 18.6 | 24.4 | 29.8 | 32.2 |
| GRAND FORKS | 18.1 | 18.7 | 19.6 | 22.8 | 29.2 | 35.6 | 41.1 |
| OSLO | 12.2 | 13.7 | 16.1 | 22.1 | 29.6 | 33.7 | 35.1 |
| DRAYTON | 14.7 | 15.7 | 17.6 | 24.4 | 32.5 | 37.4 | 40.4 |
| PEMBINA | 17.2 | 19.4 | 21.9 | 28.3 | 35.6 | 41.2 | 45.6 |

Minnesota Tributaries:

| | | | | | | | |
|-------------------------------|-------|-------|-------|-------|-------|-------|-------|
| South Fork Buffalo River..... | | | | | | | |
| SABIN | 11.6 | 11.9 | 12.9 | 13.6 | 14.4 | 15.5 | 16.9 |
| Buffalo River..... | | | | | | | |
| HAWLEY | 4.4 | 4.7 | 5.3 | 6.3 | 7.7 | 8.3 | 9.3 |
| DILWORTH | 10.7 | 12.1 | 13.7 | 17.0 | 19.2 | 21.4 | 22.9 |
| Wild Rice River..... | | | | | | | |
| TWIN VALLEY | 3.7 | 4.0 | 4.4 | 5.3 | 6.2 | 8.0 | 9.2 |
| HENDRUM | 7.1 | 9.8 | 11.4 | 17.4 | 21.4 | 25.9 | 28.2 |
| Marsh River..... | | | | | | | |
| SHELLY | 4.6 | 4.9 | 5.5 | 7.6 | 9.8 | 15.7 | 17.6 |
| Sand Hill River..... | | | | | | | |
| CLIMAX | 5.6 | 5.9 | 6.4 | 7.9 | 11.3 | 15.8 | 19.7 |
| Red Lake River..... | | | | | | | |
| HIGH LANDING | 4.1 | 4.3 | 4.6 | 5.9 | 7.3 | 8.9 | 10.3 |
| CROOKSTON | 6.5 | 6.6 | 7.2 | 8.9 | 10.8 | 14.6 | 17.0 |
| Snake River..... | | | | | | | |
| ABOVE WARREN | 60.9 | 61.0 | 61.5 | 61.9 | 62.5 | 63.0 | 64.6 |
| ALVARADO | 96.5 | 96.6 | 97.2 | 98.2 | 99.8 | 101.4 | 103.8 |
| Two Rivers River..... | | | | | | | |
| HALLOCK | 795.5 | 795.9 | 796.9 | 797.9 | 800.0 | 803.7 | 806.6 |
| Roseau River..... | | | | | | | |
| ROSEAU | 6.2 | 6.4 | 6.6 | 7.3 | 8.7 | 9.9 | 12.2 |

North Dakota Tributaries:

| | | | | | | | |
|----------------------|------|------|------|------|------|------|------|
| Wild Rice River..... | | | | | | | |
| ABERCROMBIE | 2.7 | 3.3 | 4.8 | 6.6 | 10.6 | 16.6 | 17.1 |
| Sheyenne River..... | | | | | | | |
| VALLEY CITY | 4.7 | 4.7 | 4.7 | 5.0 | 6.0 | 8.4 | 10.6 |
| LISBON | 3.4 | 3.4 | 3.4 | 4.4 | 5.8 | 11.7 | 14.1 |
| KINDRED | 4.9 | 4.9 | 4.9 | 6.3 | 9.3 | 15.8 | 19.6 |
| WEST FARGO DVRSN | 10.8 | 10.8 | 10.8 | 10.8 | 10.9 | 15.1 | 19.3 |
| HARWOOD | 73.1 | 73.1 | 73.1 | 75.1 | 78.7 | 83.9 | 90.6 |
| Maple River..... | | | | | | | |
| ENDERLIN | 1.6 | 1.6 | 3.3 | 5.6 | 7.5 | 9.2 | 11.6 |
| MAPLETON | 8.2 | 9.1 | 10.9 | 13.7 | 17.8 | 20.2 | 22.3 |
| Goose River..... | | | | | | | |
| HILLSBORO | 1.8 | 1.8 | 1.8 | 2.5 | 3.3 | 4.1 | 5.4 |
| Forest River..... | | | | | | | |
| MINTO | 1.4 | 1.4 | 1.6 | 1.9 | 2.8 | 4.2 | 5.8 |
| Park River..... | | | | | | | |
| GRAFTON* | 7.5 | 7.5 | 7.5 | 7.8 | 8.3 | 8.9 | 9.7 |
| Pembina River..... | | | | | | | |
| WALHALLA | 1.4 | 1.4 | 2.0 | 3.0 | 3.8 | 5.5 | 7.5 |
| NECHE | 2.1 | 2.3 | 3.0 | 4.8 | 6.5 | 10.0 | 13.5 |

Notes

1. Devils Lake Basin Runoff Risk is low. An additional rise of 1/4 to 1/2 a foot is expected (75% to 25% risk range). A 1/2 to 1 ft. rise on Devils Lake is considered about normal.

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

2. Red River Basin Flood Risk is overall quite low. All Red River main-stem points may see somewhat below normal spring runoff/flows.

- near to below normal soil moistures, deeper than normal frost depths.

- coupled with low winter snowpack and SWE to date.

- potentially delayed thaw cycle.

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

Near to below normal soil moisture and low to very low snowpack throughout west-central and northwest MN.

4. ND tributaries have an even lower overall runoff potential, especially across east-central and northeast ND.

Mid and Upper Sheyenne basin soils are quite dry, with very little snowpack.

Lower Sheyenne through east-central ND tribs have less dry soils and a light snowpack.

Northeast ND is generally dry soils and very low snowpack.

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