



# Red River and Devils Lake Basin - 2019 Spring Flood Outlook

Discussion Points 2/21/2019

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 Tuesday, 2/19/2019. All graphics, probabilities, and related discussions are available at [weather.gov/fgf](http://weather.gov/fgf). The next update will be issued on 3/7/2019.

## Bottom Line up Front!

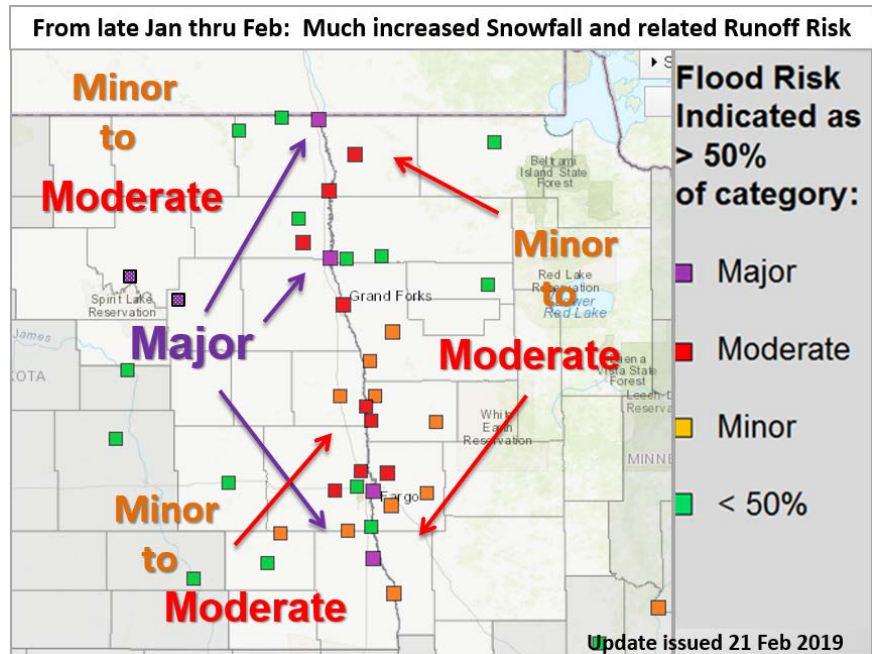
- The threat for *significant* snowmelt flooding has increased substantially across all sub-basins and for the main-stem Red River.

- We're at the mercy of March! And the prospects for a delayed thaw and/or continued substantial snowfall, late February into March.

- Late January and February have added a substantial snowpack, so that widespread, above normal, runoff is now likely.

- A deep frost, due to extensive extreme cold, should limit snowmelt infiltration, though soils are dry enough to handle some melt runoff... *if* the thaw cycle allows.

- Climate outlooks now indicate a later snowmelt and runoff cycle which increases our risk for rapid and/or rainfall enhanced runoff.



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

### Key Snowmelt Flood Components:

- 1. Base Streamflow: Near normal north, slightly above normal south.** USGS analyses indicate that the Red River and its ND and MN tributaries are thick ice covered and/or flowing within long-term normal ranges, between 25<sup>th</sup> and 75<sup>th</sup> percentiles north of Fargo. Some higher quartile flows, 76% to 95%, were noted south of Fargo.
- 2. Soil Moisture at Freeze-up: Above normal south, near normal central, below normal far north.**
- 3. Frost Depth: Deeper than normal.** Extreme cold late Dec-Feb cold has driven frost from 35 to 45 inches in most areas, with river-ice and lake-ice thicknesses near to above seasonal normal ranges.
- 4. Winter Snowpack/SWE: above normal.** Since Dec 1<sup>st</sup>, snowfall has run from 90-160 percent of normal - least in east-central ND and most from northcentral MN into the central and southern RRV. The water content (SWE) ranges from 2.5 to 4.0 inches across most areas – including the Devils Lake Basin.
- 5. Total Precipitation, Oct 1<sup>st</sup> to Feb 20<sup>th</sup> is High.** Total precipitation (rain and snow-water) measured across the Basin from Oct 1<sup>st</sup> through Feb 21<sup>st</sup> ranged from 1-3 inches above the long-term normal for most of the central and southern Red River Basin.

**New!** Along with our flood partners, we've developed a display graphic which relates the current flood outlook to our historical flood levels (for now, just along the mainstem Red River). *Check it out at:* <https://www.weather.gov/fgf/PFOS>

**DEVILS LAKE & STUMP LAKE...** Long-Range Probabilistic Outlook  
Valid February 18, 2019 - September 30, 2019

LOCATION	95%	90%	75%	50%	25%	10%	05%
CREEL BAY	1448.9	1449.0	1449.5	1449.8	1450.2	1450.7	1451.3
EAST STUMP LAKE	1448.9	1449.0	1449.5	1449.8	1450.2	1450.7	1451.3

The current heights of Devils Lake and Stump Lake are ~1448.3 ft. MSL.

Color code: Below Minor Moderate Major Flood of Record

**RED RIVER AND TRIBUTARIES...** Long-Range Probabilistic Outlook  
Valid February 25, 2019 - May 26, 2019

LOCATION	95%	90%	75%	50%	25%	10%	05%
WAHPETON	11.3	11.5	11.8	12.2	14.1	15.5	16.5
HICKSON	23.3	24.7	26.2	28.6	31.8	34.5	35.7
FARGO	24.7	26.1	28.8	31.0	33.7	36.1	36.9
HALSTAD	25.6	27.0	30.8	33.5	37.4	39.0	39.2
GRAND FORKS	41.0	41.6	42.9	44.3	46.9	49.6	51.2
OSLO	35.5	35.8	36.4	36.9	37.4	37.8	37.9
DRAYTON	39.7	40.1	40.6	41.4	42.5	43.2	44.1
PEMBINA	46.9	47.7	49.1	50.6	52.0	52.8	53.6

**Minnesota Tributaries:**

South Fork Buffalo River.....							
SABIN	13.4	13.6	13.9	14.6	15.2	16.4	18.3
Buffalo River.....							
HAWLEY	7.0	7.4	7.7	8.4	9.5	10.3	10.7
DILWORTH	17.0	17.5	18.6	20.3	21.8	22.7	24.3
Wild Rice River.....							
TWIN VALLEY	9.3	9.8	10.3	11.3	12.7	14.0	15.5
HENDRUM	24.6	25.4	27.4	29.7	31.4	32.5	32.9
Marsh River.....							
SHELLY	11.8	12.3	13.2	15.4	17.7	20.6	21.9
Sand Hill River.....							
CLIMAX	15.9	16.8	19.9	22.7	26.2	30.4	33.0
Red Lake River.....							
HIGH LANDING	8.8	9.4	10.2	11.3	12.6	13.2	13.2
CROOKSTON	17.0	17.9	19.9	21.7	24.2	27.7	29.7
Snake River.....							
ABOVE WARREN	63.8	63.9	64.4	65.3	66.1	67.9	69.5
ALVARADO	101.9	102.1	103.2	105.2	107.2	109.1	109.8
Two Rivers River.....							
HALLOCK	805.1	805.3	806.6	807.9	809.0	809.8	810.3
Roseau River.....							
ROSEAU	12.2	12.8	13.4	14.3	16.0	16.9	17.8

**North Dakota Tributaries:**

Wild Rice River.....							
ABERCROMBIE	12.7	13.9	16.6	18.7	20.7	23.4	24.0
Sheyenne River.....							
VALLEY CITY	11.4	11.9	12.4	12.8	14.5	16.9	19.6
LISBON	11.3	12.0	12.6	13.2	14.6	17.8	23.0
KINDRED	14.8	15.3	16.1	17.6	19.7	20.5	21.2
WEST FARGO DVRSN	15.1	15.1	16.1	17.2	19.3	21.3	21.3
HARWOOD	83.1	85.1	87.5	89.7	91.2	92.0	92.2
Maple River.....							
ENDERLIN	9.5	9.6	10.5	11.0	12.2	13.0	13.7
MAPLETON	19.8	20.2	20.7	21.2	22.2	22.7	23.4
Goose River.....							
HILLSBORO	6.7	7.1	8.8	10.8	12.9	14.7	16.7
Forest River.....							
MINTO	6.0	6.7	7.4	8.0	8.8	9.8	10.0
Park River.....							
GRAFTON	9.8	9.9	10.3	11.0	13.9	15.7	17.0
Pembina River.....							
WALHALLA	5.1	5.3	6.3	7.0	8.5	11.5	11.9
NECHE	8.7	9.4	10.9	12.6	16.7	20.3	20.6

**Notes**

1. **Devils Lake Basin Runoff Risk has increased a fair bit.** A somewhat above normal rise is now expected, from 1 to 2 ft. A ½ to 1 ft. rise on Devils Lake is considered about normal.

Note: Devils Lake is currently about 1.5 feet lower than this time last year.

2. **Red River Basin Runoff Risk has increased substantially.** All Red River main-stem points will see significantly higher flows,

- partly due to higher streamflow and soil moisture/runoff from the south valley,

- coupled with much higher snowmelt runoff potential across the RRB... especially the south-central valley, the MN uplands, and Red Lake River Basin,

- exacerbated by deep frost and potentially delayed thaw cycle.

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

Central and North tribs now with much higher runoff risk than previously indicated.

Roseau River Basin is nearer normal for runoff risk.

4. **ND Wild Rice is much Higher Runoff Risk.**

Mid and Upper Sheyenne is now near to slightly above normal snowpack.

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

Northeast ND is mixed, with higher risk along the Forest and Park Rivers, still fairly low along the Pembina.