Red River and Devils Lake Basin - 2022 Spring Flood Outlook

Discussion Points 3/10/2022

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This outlook is for the U.S. portion of the basin and is based on conditions through Tuesday, 3/10/2022. All graphics, probabilities, and related discussions are available at **weather.gov/fgf**. Additional updates will be issued if needed.

Bottom Line up Front:

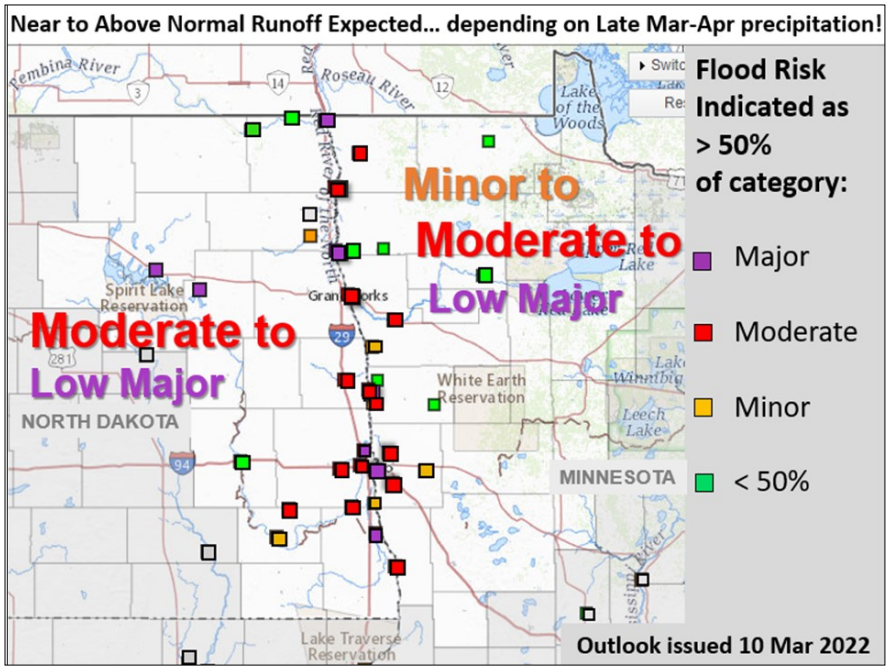
- Spring is *almost* in the Air… the risk of *significant* snowmelt flooding remains in the Moderate to Major categories:

- Lingering 2021 drought conditions with some surface storage for snow melt infiltration - if thaw is gentle.

- However, Snowfall/SWE through early March is somewhat above long term late-winter normal amounts.

- Frost depths are running somewhat deeper than long term normals, due to bitter cold Jan-Feb conditions.

- A turnaround from record driest year in 2021. *But*, not near as wet as the recent wet years of 2019 to early 2020. Soil moisture is back to within an inch plus-or-minus of normal soil moisture.



- Climate outlooks currently indicate a volatile next couple of weeks, cold-to mild-to cold, with a trend towards near normal temperatures/precipitation, mid-March through April, which helps to keep our overall risk in check.

Long Story Short: The risk for significant snowmelt flooding is moderately high, running somewhat 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 for this time of year. USGS analyses indicate that the Red River and most of its ND and MN tributaries are thickly ice covered and/or flowing at 25% -75% of normal ranges. Somewhat higher in the far southern basin and somewhat lower near the CanAm border [link: https://waterdata.usgs.gov/nwis/rt].

2. Soil Moisture at Freeze-up: Near normal. From slightly above in the far south to slightly below in the far north basins. [Link: https://www.cpc.ncep.noaa.gov/products/Soilmst_Monitoring/US/Soilmst/Soilmst.shtml]

3. Frost Depth: Somewhat Deeper than normal. A quite cold mid-winter period has allowed for deep frost penetration in most areas. Frost depths range from 20 to 60 inches in most locations, with deepest frost penetration across the northern reaches, and upland areas of the Red River Basin, where early snowpack was lighter. Lake/River ice thicknesses are running somewhat thicker than long term normal. [Link: https://www.weather.gov/ncrfc/LMI_FrostDepthMap]

4. Winter Snowpack/SWE: Somewhat Above normal. Since Dec 1st, snowfall runs from 90-140 percent of normal, SWE ranges from 2.0 to 5.0 inches [70th to 90th percentiles]. Well distributed across the sub-basins, but quite splotchy due to relocation of snow during frequent blowing snow and blizzard episodes. [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

DEVILS LAKE & STUMP LAKE...

Long-Range Probabilistic Outlook
Valid March 7, 2022 - September 30, 2022

LOCATION	95%	90%	75%	50%	25%	10%	05%
CREEL BAY	1449.8	1449.9	1450.1	1450.5	1450.9	1451.7	1452.4
EAST STUMP LAKE	1449.8	1449.9	1450.1	1450.5	1450.9	1451.7	1452.4

The current heights of Devils Lake and Stump Lake are ~1447.26 ft. MSL.

Color code: **Below** **Minor** **Moderate** **Major** ***Flood of Record***

RED RIVER AND TRIBUTARIES...

Long-Range Probabilistic Outlook
Valid March 14, 2022 – June 12, 2022

LOCATION	95%	90%	75%	50%	25%	10%	05%
WAHPETON	11.9	12.0	13.0	13.7	15.1	16.5	17.1
HICKSON	28.1	28.7	30.2	32.3	33.9	35.5	36.3
FARGO	29.1	30.7	32.0	33.6	35.0	37.0	39.0
HALSTAD	30.0	31.5	33.4	35.9	37.9	39.1	39.5
GRAND FORKS	41.6	42.5	43.7	45.2	46.9	49.6	52.4
OSLO	35.2	35.6	36.1	36.7	37.4	***38.5***	***39.7***
DRAYTON	39.8	40.3	40.6	41.5	42.2	43.5	44.5
PEMBINA	47.6	48.6	49.7	50.8	51.9	53.2	53.8
Minnesota Tributaries:							
South Fork Buffalo River.....							
SABIN	14.0	14.4	14.9	15.6	16.1	17.4	17.9
Buffalo River.....							
HAWLEY	7.3	7.5	8.1	8.9	9.6	10.3	10.8
DILWORTH	17.8	19.3	20.2	21.3	22.3	23.8	24.2
Wild Rice River.....							
TWIN VALLEY	6.1	6.4	7.1	8.2	9.3	10.7	11.8
HENDRUM	25.1	27.0	28.1	29.6	31.0	32.0	32.8
Marsh River.....							
SHELLY	10.4	11.1	12.2	13.6	15.6	18.2	19.3
Sand Hill River.....							
CLIMAX	19.0	20.7	21.9	24.3	27.2	30.8	33.4
Red Lake River.....							
HIGH LANDING	7.3	7.5	8.3	9.2	10.8	11.6	12.0
CROOKSTON	15.8	16.1	17.8	20.1	22.5	25.3	27.0
Snake River.....							
ABOVE WARREN	63.8	64.1	64.3	65.0	65.8	68.2	69.4
ALVARADO	101.8	102.4	103.5	105.3	107.8	109.2	109.9
Two Rivers River.....							
HALLOCK	804.9	806.3	807.0	807.8	808.9	810.1	***811.3***
Roseau River.....							
ROSEAU	11.9	12.7	13.6	14.9	16.0	18.1	18.9
North Dakota Tributaries:							
Wild Rice River.....							
ABERCROMBIE	16.1	17.0	18.2	19.8	21.3	23.6	25.5
Sheyenne River.....							
VALLEY CITY	12.6	13.1	13.5	14.7	18.0	20.2	***23.2***
LISBON	13.6	14.3	15.0	15.9	17.9	21.4	***24.8***
KINDRED	17.5	18.7	19.5	20.2	20.8	21.2	21.2
WEST FARGO DVRSN	17.2	18.5	19.3	20.8	21.3	21.3	21.3
HARWOOD	88.9	89.4	90.3	91.1	91.7	***92.1***	***92.2***
Maple River.....							
ENDERLIN	12.2	12.3	12.8	13.4	13.9	14.8	15.4
MAPLETON	21.0	21.3	21.6	22.1	22.7	23.4	***23.8***
Goose River.....							
HILLSBORO	11.1	11.8	13.3	14.0	14.7	15.5	16.2
Forest River.....							
MINTO	5.5	6.0	6.4	6.8	7.3	7.9	8.1
Park River.....							
GRAFTON*	-.-	-.-	-.-	-.-	-.-	-.-	-.-
Pembina River.....							
WALHALLA	5.6	6.1	6.7	7.8	9.6	12.0	12.9
NECHE	11.0	11.6	13.3	15.6	18.0	20.9	21.3

Notes

1. Devils Lake Basin Runoff Risk is moderately high. An additional rise of 3 to 4 feet is expected (75% to 25% risk range). No significant changes from early Feb. A ½ to 1 ft. rise on Devils Lake is considered about normal.

Note: Devils Lake is currently about 1.25 feet lower than this time last year.

2. Red River Basin Flood Risk is moderately high. All Red River main-stem points may see near to somewhat above normal spring runoff/flows.

- near to above normal soil moistures in the south, deeper than normal frost depths.

- moderate to high winter snowpack and SWE to date.

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

Near normal soil moisture and near (NW) to above (WC) normal snowpack in northwest through west-central MN.

4. ND tributaries have a slightly higher runoff potential across southeast ND that decreases as one moves north into northeast ND.

Mid and Upper Sheyenne basin soils are near normal moisture, while snowpack is somewhat above normal.

Lower Sheyenne through east-central ND tribs have near normal soil moisture and near to above normal snowpack.

Northeast ND has slightly drier soils with near normal snowpack. All values fairly stable since Feb Outlooks.

Note: new Grafton Bypass!