



# Red River and Devils Lake Basin – 2017 Spring Flood Outlook

Discussion Points 3/2/2017

prepared by



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This outlook is for the U.S. portion of the basin based on conditions as of Thursday, 3/2/17. All graphics and related discussion will be posted to [weather.gov/fgf](http://weather.gov/fgf). The next update, if needed, is due on or around 3/24/17.

## Bottom Line up Top!

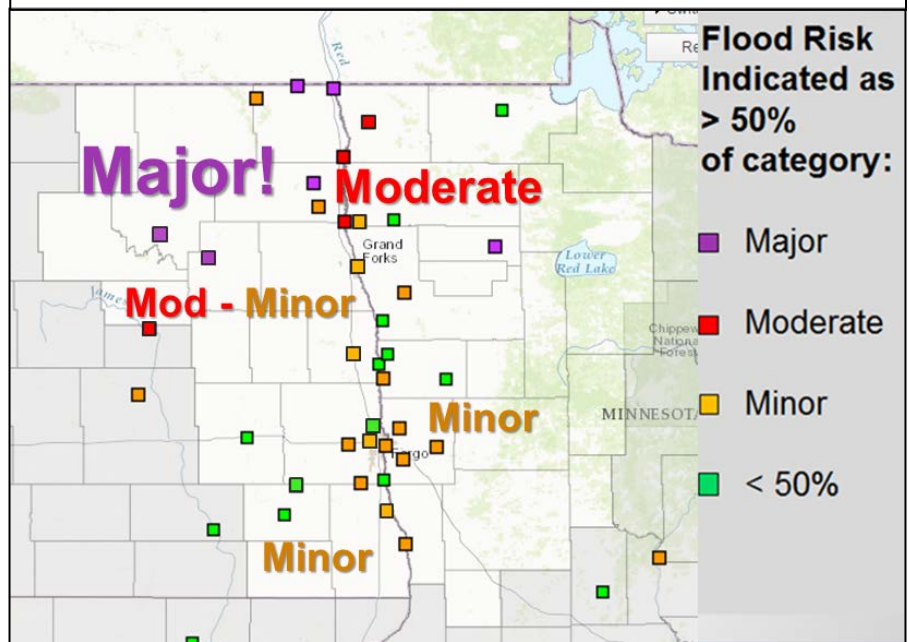
- Recent “record” thaw conditions lowered the overall flood risk slightly.

- The threat for significant, impactful snowmelt flooding is still very high for the Devils Lake Basin, where near record runoff is projected.

- The threat remains moderate to high, above the historical risk for most river points across northeast ND into far northwest MN, especially along the Park and Pembina Rivers.

- Most areas still subject to early spring snow and rain. South and central Basin locations are very near long term normal flood risk... those areas are still prone to minor or low-end moderate spring flooding.

## Since 16 Feb 2017: Only Slight Reductions Made



## Sub-Basin Details:

**Southern and Central Valley, Grand Forks and points south.** Recent “record” thaw conditions, and an overall mild, low-snow winter have eliminated winter snow cover. Most runoff has progressed into area streams and tributaries, and a fair amount has moved into the mainstem Red, especially south of Halstad.

- Snow-free areas are still subject to runoff produced by late winter snow and/or heavy spring rains.
- Soils remain largely frozen and are quite saturated from late fall rains, so high runoff rates are possible.
- The normal spring flood threat is for minor to low-end moderate flooding at most locations.

**Northern Valley, north of Grand Forks ND.** Very high soil moisture and base streamflow in most areas, coupled with either high snowfall or freezing rain/sleet has created a base for high runoff potential. Moderate flooding is expected in most areas, with an increased risk for moderate to major flooding across northeast ND into far northwest MN - where wettest soils and highest snowpack conditions are found.

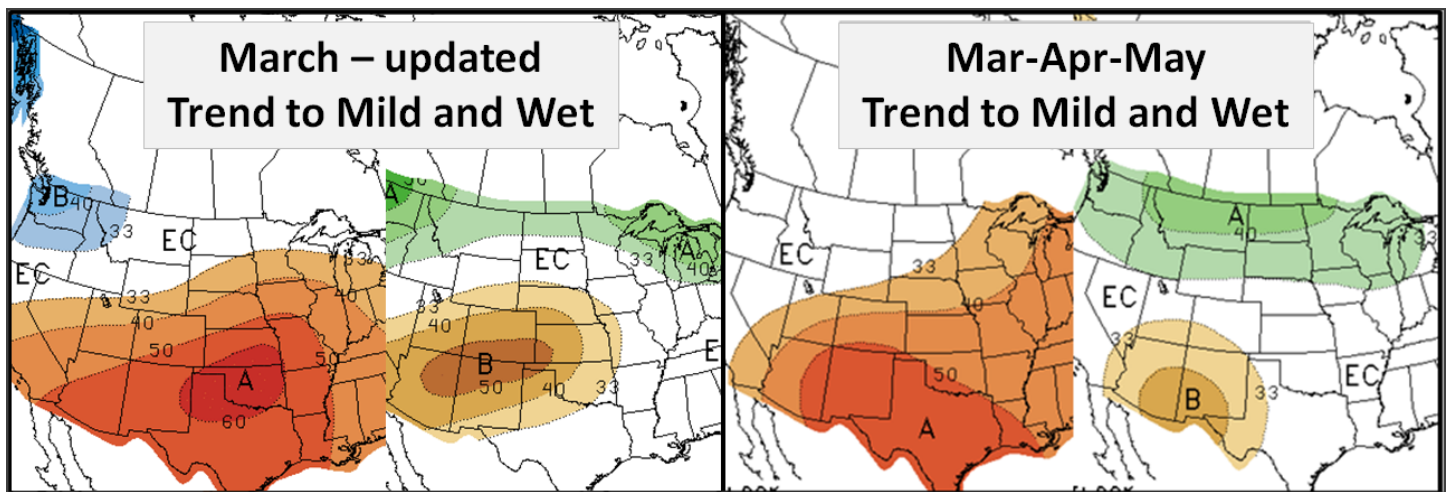
- The Park River at Grafton could still see flows near to above previous Flood-of-Record.
- The Pembina River at Neche could see flows near or just below 2013 levels.

**Devils Lake Basin.** A very wet summer and fall, along with high winter snowpack has set the stage for near record runoff into the lakes. Intermittent thawing has occurred, but moisture remains locked in the snowpack.

- Some 6 to 12 inches of excess rainfall from 2016 is draining into area lakes. Snowpack is near record level.
- Devils/Stump Lake could rise 3 to 4 feet above current levels through the coming spring runoff season.

## Status of Key Conditions:

- 1. Base Streamflow: Above normal.** USGS analysis and streamgage reports indicate that the Red River and its ND and MN tributaries are flowing at 90 to 99 percent of their seasonal normal levels, with normal ice cover north of Halstad and intermittent ice cover south.
- 2. Soil Moisture at Freeze-up: Above to much-above normal.** The rain and snow (liquid) measured across the Basin from Oct 1<sup>st</sup> through Feb 16<sup>th</sup> has ranged from 3 to 6 inches, or from 1 to 3 inches above the long term normals. Soil moisture levels and fall season precipitation surpluses rival levels last seen in the 2010-2011 fall/winter period, with soil moisture levels at freeze-up ranging from 90-99 percent of normal across the Basin.
- 3. Frost Depth: Near to below normal.** Recent snowmelt has exposed topsoil across most of the central southern basin. Surface thaw areas there have since refrozen, and somewhat porous frost depths have plunged to more than 20 inches. North Basin frost depths vary from 8-20 inches, with shallow frost under deep snow pack.
- 4. Winter Snowpack/SWE: Much reduced snow cover south, snow cover and snow water persist north.** Winter Snowpack and Snow Water Equivalent (SWE) have been eliminated south of Grand Forks. However, much of the runoff remains locked in area streams and rivers. Snowpack in the Devils Lake and far northern Red River Basins has shrunk to half or less, but snow water remains locked in snow or at top of soil.
- 5. The last part of winter, into early spring should trend mild and somewhat wet!** The NWS Climate Prediction Center (CPC) has updated the outlook for March, and now expects temperatures to trend to near or slightly above normal with somewhat above normal precipitation, including some light rain. From March into early April should see that trend persist... along with an increased risk (higher than normal) for thunderstorms.



## Long Story Short:

- Major flood risk for Devils Lake Basin and across northeast ND tributaries.
- Moderate-Major flood risk across far northwest MN tributaries and northern Red River.
- Flood risk lower, near long-term normal, for the southern and central Red River Valley.

## By the Numbers:

DEVILS AND STUMP LAKES LONG-RANGE PROBABILISTIC OUTLOOK  
VALID FEBRUARY 26, 2017 - SEPTEMBER 30, 2017

LOCATION	95%	90%	75%	50%	25%	10%	05%
CREEL BAY	1452.8	1452.8	1453.2	1453.6	1454.0	1454.6	1455.2
EAST STUMP LAKE	1452.8	1452.8	1453.2	1453.6	1454.0	1454.6	1455.2

THE CURRENT HEIGHT OF DEVILS LAKE AT CREEL BAY IS NEAR 1450.2 FEET  
THE CURRENT HEIGHT OF STUMP LAKE NEAR LAKOTA IS NEAR 1450.2 FEET

Color code:    Below    Minor    Moderate    Major    Flood of Record

CHANCE OF EXCEEDING STAGES AT MAINSTEM RED RIVER LOCATIONS

VALID 3/05/2017 - 6/03/2017

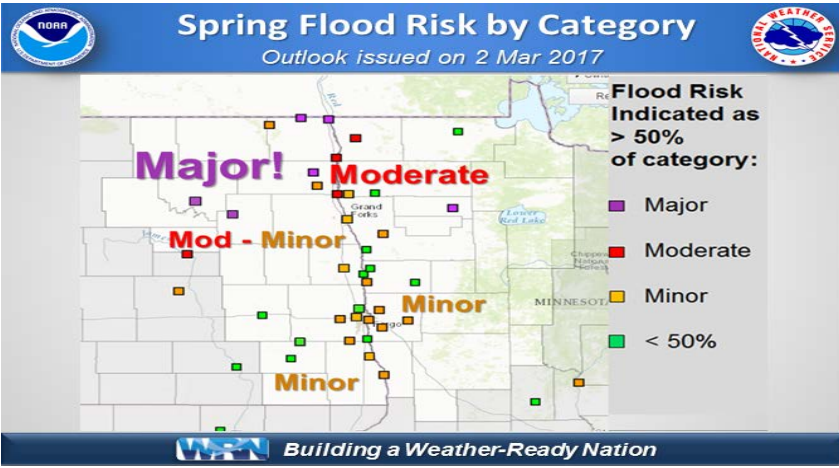
LOCATION	95%	90%	75%	50%	25%	10%	05%
WAHPETON	8.7	9.5	10.8	11.6	13.3	15.2	15.6
HICKSON	17.7	18.4	22.2	24.5	28.0	32.9	34.0
FARGO	17.9	19.1	20.9	24.1	28.5	32.5	35.0
HALSTAD	15.6	17.2	19.7	24.6	29.9	33.6	35.6
GRAND FORKS	29.5	31.0	35.5	40.0	43.3	45.0	47.7
OSLO	30.7	31.7	33.8	34.8	36.0	36.7	37.9
DRAYTON	35.8	37.9	39.6	40.8	41.3	42.2	43.4
PEMBINA	46.9	47.6	49.5	50.8	51.6	52.7	53.5

Minnesota Tributaries:

South Fork Buffalo River.....							
SABIN	11.5	11.9	12.8	13.6	14.5	15.2	15.9
Buffalo River.....							
HAWLEY	5.8	6.1	6.9	8.1	8.8	9.5	10.2
DILWORTH	11.5	12.8	14.7	17.8	19.6	20.9	22.0
Wild Rice River.....							
TWIN VALLEY	5.3	5.8	6.6	7.6	8.8	10.4	11.5
HENDRUM	14.6	16.2	19.1	22.3	26.2	29.1	30.4
Marsh River.....							
SHELLY	6.5	7.2	9.1	10.8	12.9	16.1	18.0
Sand Hill River.....							
CLIMAX	8.9	10.1	11.6	13.2	17.2	22.2	27.4
Red Lake River.....							
HIGH LANDING	12.9	13.0	13.1	13.2	13.3	13.4	13.6
CROOKSTON	15.8	17.3	19.1	20.8	22.5	24.4	25.5
Snake River.....							
ABOVE WARREN	64.4	64.6	65.0	65.6	66.8	68.1	69.7
ALVARADO	105.1	105.3	106.3	107.8	109.0	109.8	110.3
Two Rivers River.....							
HALLOCK	807.6	807.1	808.7	809.5	810.2	810.7	811.1
Roseau River.....							
ROSEAU	12.8	13.0	14.2	15.4	16.4	17.3	17.4

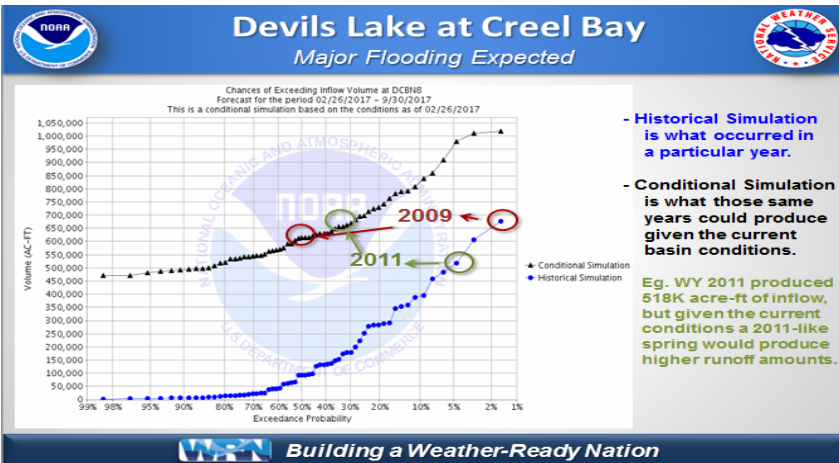
North Dakota Tributaries:

Wild Rice River.....							
ABERCROMBIE	3.7	5.4	7.4	11.2	15.0	17.5	19.8
Shyenne River.....							
VALLEY CITY	11.5	11.7	12.3	13.1	16.5	20.0	23.4
LISBON	11.2	11.4	11.9	13.0	15.8	19.5	24.5
KINDRED	13.8	14.0	14.8	16.5	20.0	21.1	21.1
WEST FARGO DVRSN	16.4	16.5	17.3	18.5	22.3	23.1	23.2
HARWOOD	878.3	879.1	880.1	883.0	887.0	891.2	892.0
Maple River.....							
ENDERLIN	7.3	7.6	8.4	9.1	10.6	12.3	13.4
MAPLETON	899.1	899.7	902.1	905.8	907.6	908.7	909.4
Goose River.....							
HILLSBORO	7.8	8.5	10.2	12.3	13.6	14.5	15.9
Forest River.....							
MINTO	6.5	6.7	7.1	7.5	7.9	8.7	8.8
Park River.....							
GRAFTON	14.5	14.8	16.1	17.2	18.1	19.4	20.0
Pembina River.....							
WALHALLA	11.6	12.0	12.7	13.9	14.8	15.8	16.4
NECHE	20.3	20.7	21.2	21.4	21.5	21.6	21.6

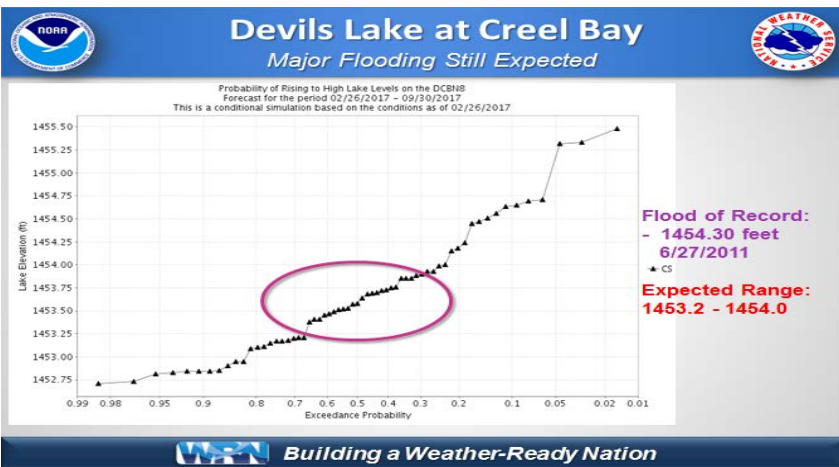


## Devils Lake Basin 2 March 2017 Addenda

- High spring runoff potential
- 8-12 inches excess rain in 2016
- Record high snowpack/SWE in largely still in place
- Potential for additional snow and rain during runoff period

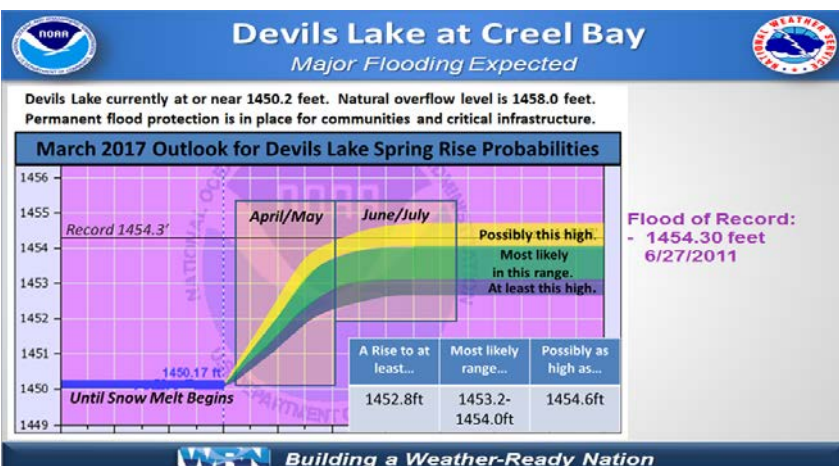


- Extensive overland flooding is possible



- Runoff could rival 2009/2011
- Onset late March into April

- Risk of 3-4 foot rise across Devils and Stump Lakes



- Rapid rises from April into May
- Half foot or more per week
- Peak in early to middle June