



Red River and Devils Lake Basin – 2017 Spring Flood Outlook

Discussion Points 2/16/2017

prepared by



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This outlook is for the U.S. portion of the basin based on conditions as of Thursday, 2/16/17. All graphics and related discussion will be posted to weather.gov/fgf. The next update is due out 3/2/17.

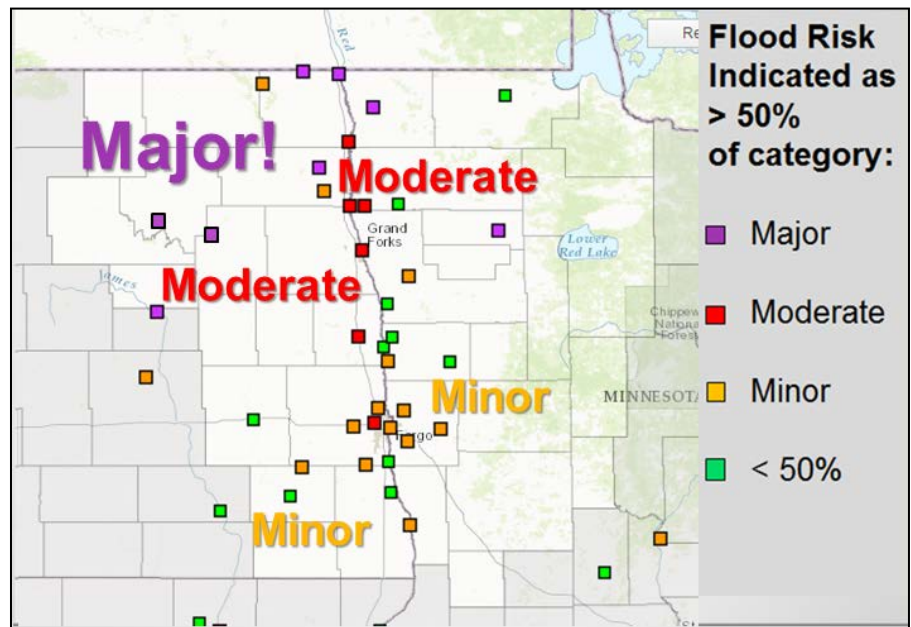
Bottom Line up Top!

- Recent/expected thaw conditions lower 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.

- Thawing conditions now and into next week should lower flood risk more noticeably in the southern Red River Basin... to very near long term normals, though area is still prone to minor or low-end moderate spring flooding.



Sub-Basin Details:

Southern and Central Valley, south of Grand Forks ND. Recent and expected thaw conditions, and an overall mild, low-snow winter will reduce available snowmelt runoff for most tributaries and for 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. 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.

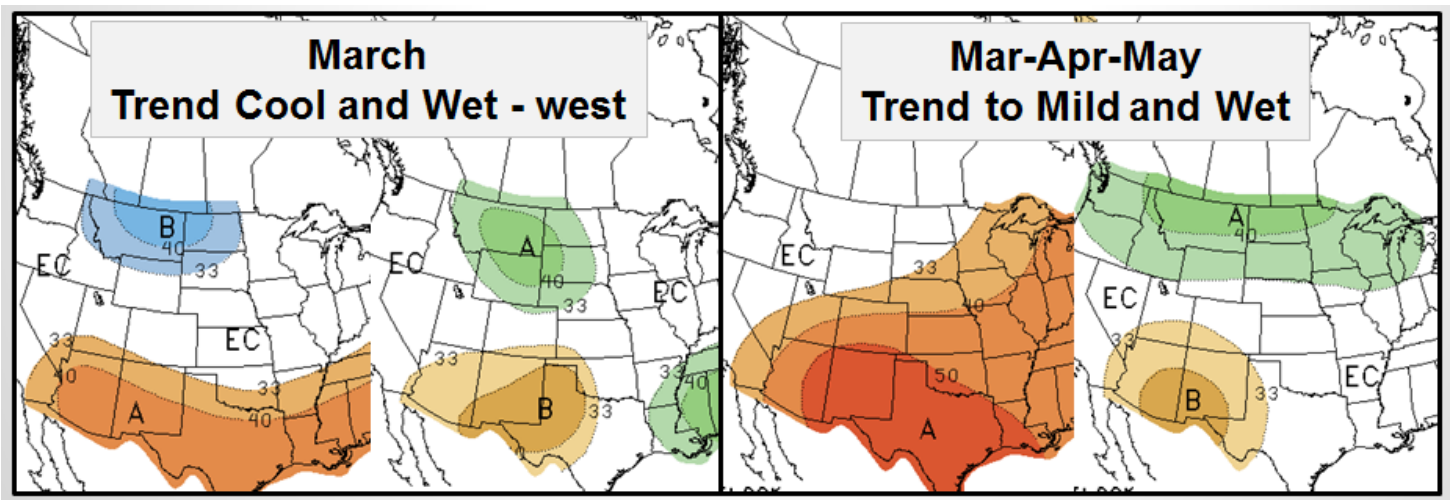
- The Park River at Grafton could still see flows near to above previous Flood-of-Record.
- The Pembina River at Neche could see flows near or just below 2013 levels.

Devils Lake Basin. A wet summer and fall, along with high winter snowpack has set the stage for near record runoff into the lakes. Though intermittent thawing has or will occur, 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 ice covered and/or flowing at 90 to 99 percent of their seasonal normal levels.
- 2. Soil Moisture at Freeze-up: Above to much-above normal.** The rain and snow (liquid) measured across the Basin from Oct 1st through Feb 16th 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 normal.** The late December and early January cold snaps drove frost to from 12 to 24 inches in most areas, with somewhat lesser amounts in areas of deep and early snowpack. River and lake ice reports are near normal ranges north, and diminishing south.
- 4. Winter Snowpack/SWE: From much below normal to much-above normal.** Winter Snowpack and Snow Water Equivalent (SWE) range dramatically across the area, and are highest across northern areas and lowest in the south. SWE ranges from an inch or less near Fargo, 2 inches near Grand Forks, and from 3 to 6 inches in the Devils Lake Basin and across to far northwest Minnesota.
- 5. The last part of winter, into early spring should be a highly variable climate regime!** The NWS Climate Prediction Center (CPC) expects the mid to late February period to remain well above normal for temperatures with above normal precipitation, including some light rain. Early March should see a trend to near or below normal temperatures and near to above normal precipitation.



Long Story Short:

- Significant flood risk for Devils Lake Basin and across northeast ND tributaries.
- Reduced flood risk in the southern Red River Valley.
- Status quo across most central Valley and Northwest MN locations.

By the Numbers:

DEVILS AND STUMP LAKES LONG-RANGE PROBABILISTIC OUTLOOK

VALID FEBRUARY 12, 2017 - SEPTEMBER 30, 2017

LOCATION	95%	90%	75%	50%	25%	10%	05%
CREEL BAY	1452.8	1452.9	1453.3	1453.7	1454.1	1454.7	1455.2
EAST STUMP LAKE	1452.8	1452.9	1453.3	1453.7	1454.1	1454.7	1455.2

THE CURRENT HEIGHT OF DEVILS LAKE AT CREEL BAY IS NEAR 1450.17 FEET
 THE CURRENT HEIGHT OF STUMP LAKE NEAR LAKOTA IS NEAR 1450.17 FEET

Color code: Below Minor Moderate Major Flood of Record

CHANCE OF EXCEEDING STAGES AT MAINSTEM RED RIVER LOCATIONS

VALID 2/19/2017 - 5/20/2017

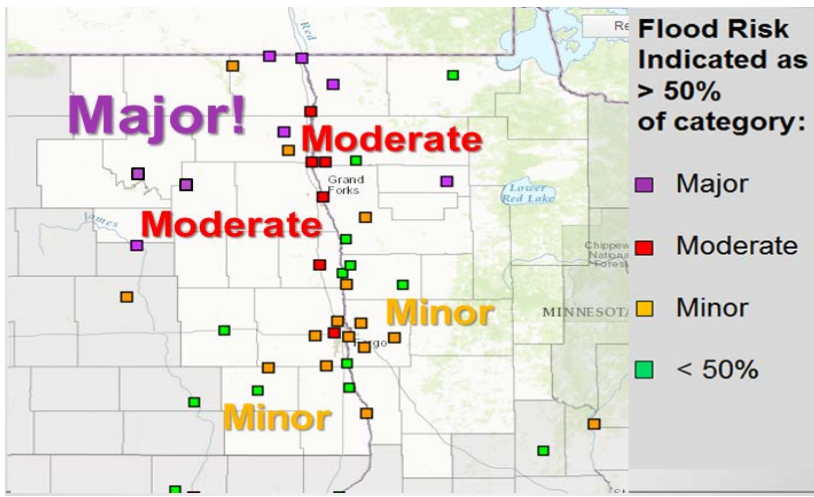
LOCATION	95%	90%	75%	50%	25%	10%	05%
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WAHPETON	10.3	10.5	10.8	11.5	12.7	14.6	15.5
HICKSON	20.9	21.5	22.4	24.6	27.6	32.2	33.8
FARGO	20.0	20.8	21.5	23.8	29.0	33.2	34.0
HALSTAD	16.3	18.9	22.0	25.8	31.7	35.8	38.1
GRAND FORKS	31.7	34.0	38.9	40.8	44.4	47.2	49.7
OSLO	32.4	33.5	34.5	35.2	36.5	37.6	38.7
DRAYTON	38.1	38.9	40.2	41.2	42.2	42.9	43.9
PEMBINA	47.7	48.7	50.1	51.5	52.6	53.4	53.9

Minnesota Tributaries:

South Fork Buffalo River.....							
SABIN	11.8	12.3	12.8	13.6	14.4	15.3	15.5
Buffalo River.....							
HAWLEY	6.2	6.5	7.3	8.0	8.8	9.8	10.3
DILWORTH	12.5	12.9	15.0	18.0	19.5	21.4	22.3
Wild Rice River.....							
TWIN VALLEY	5.6	6.0	6.5	7.9	9.2	10.9	11.9
HENDRUM	15.6	17.6	20.6	22.7	27.4	29.7	31.1
Marsh River.....							
SHELLY	8.7	9.4	10.9	12.2	14.8	18.0	19.1
Sand Hill River.....							
CLIMAX	11.2	11.5	12.0	15.7	19.7	23.1	28.2
Red Lake River.....							
HIGH LANDING	10.6	11.4	12.8	13.0	13.2	13.4	13.6
CROOKSTON	15.1	15.6	17.1	19.7	21.7	23.7	25.6
Snake River.....							
ABOVE WARREN	64.6	64.8	65.1	66.0	67.1	68.3	70.3
ALVARADO	105.2	105.7	106.5	108.6	109.3	109.9	110.5
Two Rivers River.....							
HALLOCK	807.2	807.6	808.5	809.1	810.1	811.1	811.9
Roseau River.....							
ROSEAU	11.8	12.4	13.2	14.5	16.1	16.8	17.1

North Dakota Tributaries:

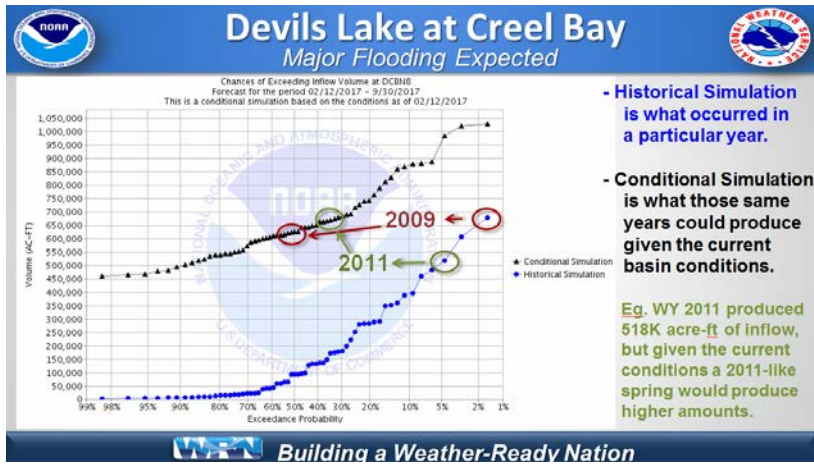
Wild Rice River.....							
ABERCROMBIE	5.7	6.4	7.5	10.1	15.2	18.4	20.1
Shyenne River.....							
VALLEY CITY	11.9	12.6	13.4	14.2	17.5	19.8	20.6
LISBON	11.5	12.3	13.1	13.9	17.2	19.7	20.5
KINDRED	14.3	15.3	16.5	18.0	20.5	21.1	21.1
WEST FARGO DVRSN	16.6	17.9	18.5	20.4	22.8	23.1	23.2
HARWOOD	879.6	880.1	881.2	884.6	889.3	891.2	892.1
Maple River.....							
ENDERLIN	7.4	7.8	9.2	9.9	11.2	12.4	13.6
MAPLETON	900.8	901.9	904.6	906.1	907.6	908.6	909.4
Goose River.....							
HILLSBORO	8.3	9.2	11.2	13.6	14.1	15.7	16.3
Forest River.....							
MINTO	6.5	7.0	7.4	7.9	8.4	9.0	9.2
Park River.....							
GRAFTON	14.3	15.1	15.9	17.2	18.6	19.3	20.0
Pembina River.....							
WALHALLA	11.8	12.0	13.2	14.3	15.2	16.4	16.6
NECHE	20.7	20.8	21.4	21.4	21.5	21.6	21.7



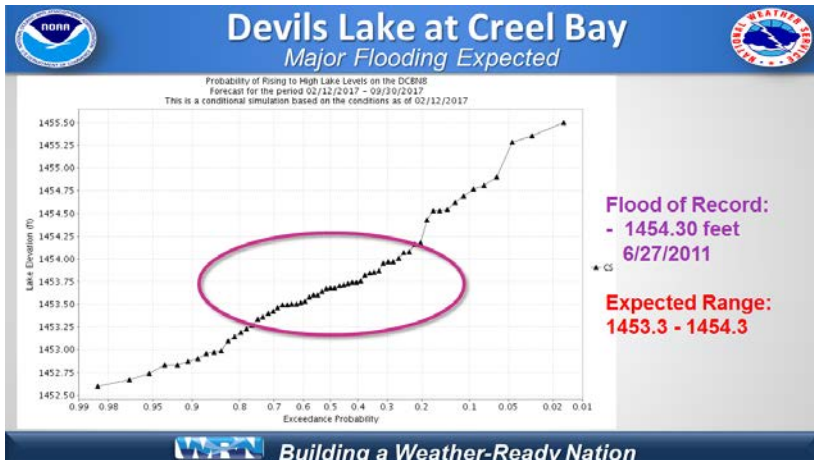
Devils Lake Basin

16 Feb 2017 Addenda

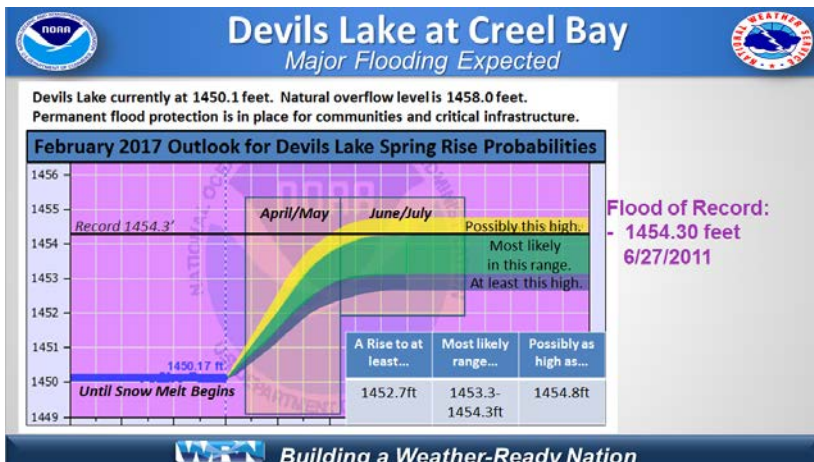
- High spring runoff potential
- 8-12 inches excess rain in 2016
- Record high snowpack/SWE is in place now
- Potential for above avg. snow and protracted thaw



- 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