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PROBABILISTIC HYDROLOGIC OUTLOOK

NATIONAL WEATHER SERVICE EASTERN NORTH DAKOTA/GRAND FORKS ND

1056 AM CST Thu Feb 27 2025

...SPRING FLOOD AND WATER RESOURCES OUTLOOK...

...RED RIVER BASIN OUTLOOK FOR RIVER FLOOD POTENTIAL...

This outlook covers the Red River of the North
and its Minnesota and North Dakota tributaries.

...MINOR TO ISOLATED MODERATE SPRING FLOODING IS EXPECTED FOR SOME
LOCATIONS IN THE RED RIVER OF THE NORTH BASIN...

* This 90-day outlook covers the period from 3/3/2025 to 6/1/2025.

.OUTLOOK SUMMARY...

* Probabilities for exceeding Major, Moderate, Minor Flood Stage...

Major Flooding...

There is a low risk (less than 35 percent chance) of major
flooding across the basin.

Moderate Flooding...

There is a medium risk (35 to 65 percent chance) of moderate flooding at Fargo/Moorhead and Oslo on the Red River. In North Dakota, there is a medium risk of moderate flooding at Abercrombie on the Wild Rice River.

There is a low risk (less than 35 percent chance) of moderate flooding elsewhere across the basin.

Minor Flooding...

There is a high risk (greater than 65 percent chance) of minor flooding at Grand Forks/East Grand Forks and Pembina on the Red River. In Minnesota, there is a high risk of minor flooding at Sabin on the South Branch Buffalo River, Dilworth on the Buffalo River, and Hallock on the Two Rivers River.

There is a medium risk (35 to 65 percent chance) of minor flooding at Wahpeton and Drayton on the Red River. In Minnesota, there is a medium risk of minor flooding at Hendrum on the Wild Rice River and Crookston on the Red Lake River. In North Dakota, there is a medium risk of minor flooding at Mapleton on the Maple River.

There is a low risk (less than 35 percent chance) of minor flooding elsewhere across the basin.

.OUTLOOK DISCUSSION...

Hydrologic and climate conditions which affect each of the several factors that significantly determine the timing and magnitude of spring snowmelt flooding within the Red River of the North are discussed below:

* FALL AND WINTER PRECIPITATION AND SNOWPACK...

Overall, fall precipitation (September-November 2024) was below normal for much of the basin. However, the fall season did end with well above normal November precipitation, especially across northeastern North Dakota, which saturated soils before freezing up. Below normal precipitation continued through the winter, allowing abnormally dry to severe drought conditions to persist across the southern basin and into north central Minnesota.

* RIVER FLOWS...

At the end of December, USGS analyses indicated the Red River and its tributaries were flowing near to slightly above normal (especially in the far south) due to above normal November precipitation.

* FROST DEPTHS...

Minimal to no snowpack early in the winter, followed by stretches of below normal temperatures, led to the formation of a deep frost layer. Currently, frost depth values range from 35 to 50 inches across the basin although some thawing of the top layer of soil has occurred due to recent above normal temperatures.

* SNOWPACK CONDITIONS...

Snowfall (and associated water content) since December 1 is running 25 to 75 percent of normal, lowest across the southern and central basin and up into northwestern Minnesota. Recent above normal temperatures have allowed melting of the snowpack to commence with current snow depths ranging from zero across the southern basin to up

to 10 inches in isolated areas near the international border.

 * FACTORS YET TO BE DETERMINED...
    - Further snowpack growth,
    - Rate of snowmelt/thaw,
    - Heavy rain on snow or frozen ground during thaw or peak flood,
    - Heavy rain on ice-covered rivers causing short-term ice jams.

* SHORT TERM WEATHER FORECAST...

  Above normal temperatures are expected to continue for at least the next 1 to 2 weeks. Precipitation chances look to be minor at this time.

* LONG TERM CLIMATE OUTLOOK...

  Climate outlooks now indicate above normal temperatures throughout March which will continue to melt any remaining snowpack and slowly thaw frozen soils. While near to below normal precipitation is currently predicted, any rainfall on frozen ground (or any lingering snowpack) will continue to be the most important flood risk factor.

.NEXT SPRING FLOOD OUTLOOK...

  The next 2025 spring flood outlook will be issued on Thursday, March 13, 2025.

.FLOOD OUTLOOK PROBABILITIES TABLES...

The following message has two sections: the first gives the
 current and normal/historical chances of river locations reaching
  their minor, moderate, and major flood category. The second
   gives the current chances of river locations rising above river

stages listed.

...Red River Long-Range Probabilistic Outlook by Flood Category...

Valid from March 03, 2025 to June 01, 2025

In Table 1 below, the current (CS) and historical (HS), or normal, probabilities of exceeding minor, moderate, and major flood stages are listed for the valid time period.

CS values indicate the probability of reaching a flood category based on current conditions.

HS values indicate the probability of reaching a flood category based on historical, or normal, conditions.

When the value of CS is greater than HS, the probability of exceeding that level is higher than normal. When the value of CS is less than HS, the probability of exceeding that level is lower than normal.

...Table 1--Probabilities for Minor, Moderate, and Major Flooding

Valid Period: 03/03/2025 - 06/01/2025

				: Current and Historical Chances of Exceeding Flood Categories as a Percentage (%)					
	Categorical Flood Stages (FT)			: Minor		Moderate		Major	
Location	Minor	Mod	Major	: CS	HS	CS	HS	CS	HS
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Red River of the North.....										
WAHPETON	11.0	13.0	15.0	53	59	20	28	<5	17
HICKSON	30.0	34.0	38.0	15	27	<5	14	<5	<5
FARGO	18.0	25.0	30.0	89	83	36	40	13	26
HALSTAD	26.0	32.0	37.5	27	38	8	22	<5	12
GRAND FORKS	28.0	40.0	46.0	67	60	17	31	<5	11
OSLO	26.0	30.0	36.0	75	63	60	56	5	18
DRAYTON	32.0	38.0	42.0	48	48	23	33	<5	12
PEMBINA	39.0	44.0	49.0	66	52	33	43	9	22

	Categorical Flood Stages (FT)			: Current and Historical Chances of Exceeding Flood Categories as a Percentage (%)					
				: Minor		Moderate		Major	
Location	Minor	Mod	Major	: CS	HS	CS	HS	CS	HS
---	---	---	---	---	---	---	---	---	---
Minnesota Tributaries.....									
SABIN	13.0	15.0	19.0	85	61	13	17	<5	<5
HAWLEY	8.0	9.0	11.0	33	41	11	25	<5	<5
DILWORTH	13.0	20.0	26.0	88	70	14	21	<5	<5
TWIN VALLEY	10.0	12.0	14.0	<5	18	<5	8	<5	<5
HENDRUM	20.0	28.0	32.0	49	53	8	22	<5	7
SHELLY	14.0	20.0	23.0	7	28	<5	11	<5	6
CLIMAX	20.0	25.0	30.0	8	25	<5	12	<5	8
HIGH LANDING	12.0	12.5	13.0	<5	8	<5	<5	<5	<5
CROOKSTON	15.0	20.0	23.0	56	50	12	27	5	9
ABOVE WARREN	67.0	71.0	75.0	8	13	<5	<5	<5	<5
ALVARADO	106.0	108.0	110.0	27	26	10	17	<5	<5
HALLOCK	802.0	806.0	810.0	72	62	24	41	<5	10
ROSEAU	16.0	18.0	19.0	<5	21	<5	13	<5	8

				: Current and Historical					
				: Chances of Exceeding					
				: Flood Categories					
				: as a Percentage (%)					
	Categorical			:					
	Flood Stages (FT)			:	Minor		Moderate		Major	
Location	Minor	Mod	Major	:	CS	HS	CS	HS	CS	HS
North Dakota Tributaries.....										
ABERCROMBIE	20.0	22.0	28.0	:	46	40	38	34	7	20
VALLEY CITY	15.0	16.0	17.0	:	<5	10	<5	7	<5	6
LISBON	15.0	17.0	19.0	:	<5	11	<5	10	<5	7
KINDRED	16.0	19.0	20.5	:	10	20	<5	11	<5	10
WEST FARGO DVRSN	18.0	20.0	21.0	:	6	12	<5	11	<5	10
HARWOOD	84.0	86.0	91.0	:	15	26	12	21	6	10
ENDERLIN	9.5	12.0	14.0	:	26	26	7	11	<5	<5
MAPLETON	18.0	21.0	23.0	:	41	38	13	18	<5	5
HILLSBORO	10.0	13.0	16.0	:	12	19	<5	10	<5	<5
MINTO	6.0	8.0	11.0	:	19	23	<5	9	<5	<5
WALHALLA	11.0	16.0	18.0	:	13	21	<5	<5	<5	<5
NECHE	18.0	19.0	20.5	:	26	27	24	26	14	20

LEGEND:

CS = Conditional Simulation (Outlook for current conditions)

HS = Historical Simulation (" " normal conditions)

FT = Feet (above gage zero datum)

...Red River Long-Range Probabilistic Outlook by River Stage...

Valid from March 03, 2025 to June 01, 2025

LOCATION	95%	90%	75%	50%	25%	10%	05%
Red River of the North.....							
WAHPETON	8.5	9.0	10.1	11.2	12.6	14.3	14.7
HICKSON	15.3	16.6	19.4	22.1	26.8	31.5	33.1
FARGO	17.0	17.5	19.7	22.4	27.2	32.2	34.6
HALSTAD	12.7	13.4	16.9	21.3	26.5	31.7	35.6
GRAND FORKS	21.8	22.7	26.7	31.5	38.1	42.0	44.3
OSLO	19.5	20.7	26.2	31.7	34.3	35.5	36.4
DRAYTON	20.8	21.4	26.1	31.7	37.3	39.7	41.1
PEMBINA	30.3	32.1	36.9	42.2	46.2	48.6	50.4

Minnesota Tribs:	95%	90%	75%	50%	25%	10%	05%
South Fork Buffalo River.....							
SABIN	12.6	12.7	13.4	13.9	14.5	15.1	16.1
Buffalo River.....							
HAWLEY	5.3	5.6	6.2	7.3	8.6	9.0	9.3
DILWORTH	12.3	12.9	15.1	17.1	19.3	20.9	21.6
Wild Rice River.....							
TWIN VALLEY	4.6	4.8	5.6	6.5	7.7	8.7	10.0
HENDRUM	12.2	13.8	17.0	19.9	23.6	27.4	28.9
Marsh River.....							
SHELLY	6.9	7.7	8.8	9.5	11.2	12.9	14.9
Sand Hill River.....							
CLIMAX	9.1	9.7	11.2	11.8	15.5	19.1	22.2
Red Lake River.....							
HIGH LANDING	3.6	4.2	5.0	6.3	8.2	9.1	10.0
CROOKSTON	10.2	10.6	12.6	15.5	17.4	20.7	23.2
Snake River.....							
ABOVE WARREN	62.6	62.8	63.3	64.1	65.1	66.5	68.1

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  ALVARADO            99.6  100.3  101.1  103.1  106.3  108.0  109.4
Two Rivers River.....
  HALLOCK            799.6  800.2  801.7  804.0  805.5  807.5  808.8
Roseau River.....
  ROSEAU               8.8    9.0    9.7   11.1   13.1   15.5   16.0



North Dakota Tribs:   95%    90%    75%    50%    25%    10%    05%
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Wild Rice River.....
  ABERCROMBIE         12.7   13.5   15.2   19.5   24.2   27.4   29.3
Sheyenne River.....
  VALLEY CITY          5.8    6.1    6.9    8.4   11.0   12.0   12.8
  LISBON               5.3    5.5    6.4    8.1   10.8   11.9   14.5
  KINDRED              6.7    6.9    7.9    9.9   12.9   15.8   18.8
  WEST FARGO DVRSN    10.7   10.8   10.9   11.6   13.0   15.4   18.7
  HARWOOD             75.3   75.5   76.0   78.2   80.1   86.6   91.2
Maple River.....
  ENDERLIN             5.4    5.8    7.0    8.0    9.7   11.3   12.4
  MAPLETON            11.8   12.7   14.0   16.9   19.5   21.2   22.5
Goose River.....
  HILLSBORO            3.4    3.6    4.2    5.3    7.5   10.3   12.6
Forest River.....
  MINTO                3.2    3.3    3.8    4.3    5.1    6.5    7.5
Pembina River.....
  WALHALLA             6.0    6.2    7.0    7.8    9.6   12.0   13.3
  NECHE               10.8   11.4   13.1   15.0   18.1   20.9   21.1



.THE OUTLOOK PRODUCTION PROCESS...

This long range probabilistic outlook is based on a series of peak
 river levels or crests taken from the forecast hydrograph results
 of the NWS Community Hydrologic Prediction System (CHPS). The model
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is run for multiple scenarios starting at current river levels and soil conditions using 70 years (1949-2019) of past precipitation and temperature conditions that were experienced for those past years during the time-frame of the outlook period. These crests can then be ranked from lowest to highest and assigned an exceedance probability. For example, for a series of 50 years, the lowest ranked crest has 49 crests above it and since 95 percent of the crests are above it, it is assigned a 95 percent probability of exceedance (POE).

A YouTube video on "How to Interpret River Outlook Products" is at:

www.youtube.com/watch?v=pSoEgvsnpv4

The probabilities can be used for risk management by using them as an indication of the range of crests that may be expected during the valid period of the outlook. By providing a range of peak river level probabilities, the NWS is contributing to the area`s Decision Support Services that help with long-range flood planning and response readiness. This outlook is a part of NOAA`s National Weather Service`s NWPS (National Water Prediction Service).

.ADDITIONAL INFORMATION SOURCES...

The NWPS Long-Range Probabilistic Hydrologic Outlooks are issued each month typically between the first and second Friday after mid-month. However, Spring Flood and Water Resources Outlooks are issued several times leading up to the spring melt period, usually on Thursdays beginning in late February or early March and ending in early April, depending on the spring flooding conditions.

This outlook is also presented as graphs of the probability of stage exceedance for the full period and for weekly intervals during the period. These graphs, along with explanations for interpreting them,

are available from the NWS Grand Forks NWPS web page:

www.weather.gov/grandforks or weather.gov/fgf

then click on the "Rivers and Lakes" tab above the map.

Current river conditions for all river forecast points in the Red River of the North and Devils/Stump Lake basins are also available on our website, as well as 7-day forecasts when river levels at forecast points are in or near flood.

Additional Probabilistic Hydrologic Outlooks will be issued monthly throughout the rest of the year during the later part of the month or as conditions warrant.

Refer to the separate Devils Lake Probabilistic Hydrologic Outlook for Devils and Stump Lakes Probability of Exceedance levels and low-water non-exceedance levels.

If you have any questions, contact the NWS at 701-772-0720.

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