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PROBABILISTIC HYDROLOGIC OUTLOOK
NATIONAL WEATHER SERVICE EASTERN NORTH DAKOTA/GRAND FORKS ND
1141 AM CST Thu Jan 23 2025

...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 1/27/25 to 4/27/25.

.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...
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There is a medium risk (35 to 65 percent chance) of moderate flooding at Oslo and Pembina 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 Fargo/Moorhead and Grand Forks/East Grand Forks on the Red River. In Minnesota, there is a high risk of minor flooding at Sabin on the South Branch Buffalo River and Dilworth on the Buffalo River.

There is a medium risk (35 to 65 percent chance) of minor flooding at Wahpeton and Drayton on the Red River. In North Dakota, there is a medium risk of minor flooding at Enderlin and Mapleton on the Maple River and Neche on the Pembina River. In Minnesota, there is a medium risk of minor flooding at Hendrum on the Wild Rice River and Hallock on the Two Rivers 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 SOIL MOISTURE...

Overall, fall precipitation (September-November 2024) was below normal for much of the basin. However, the fall season did end with November precipitation being well above normal. This allowed soils to become fairly saturated before freezing up, especially across northeastern North Dakota. Abnormally dry to moderate drought conditions have persisted throughout the winter across much of the basin (exception being the Devils Lake basin and far northern Red River Valley).

* RIVER FLOWS...

At the end of December, base streamflows were flowing higher than normal on the Red River mainstem and many of its tributaries (primarily due to the above normal November precipitation).

* FROST DEPTHS...

Minimal to no snowpack early in the winter, followed by stretches of below normal temperatures, has led to the formation of a deep frost layer. Frost depth values of 25 to 35 inches are common across much of the basin. Deeper frost may contribute to greater runoff of snowmelt and spring precipitation.

* SNOWPACK CONDITIONS...

Snowfall (and associated water content) since December 1 is running 50 to 75 percent of normal, lowest across the far southern basin up into northwestern Minnesota. The exception is northern portions of the Devils Lake basin and into far northeastern North Dakota.

* 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...

  Mostly dry and potentially breezy conditions are expected through the end of January. Near normal temperatures will be in place until late in the weekend and early next week when things will warm up to above normal.

* LONG TERM CLIMATE OUTLOOK...

  Climate outlooks indicate generally below normal temperatures for the remainder of the winter and into spring. This could lead to a delayed snowmelt runoff period.

.NEXT SPRING FLOOD OUTLOOK...

   The next 2025 spring flood outlook will be issued on Thursday, February 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 January 27, 2025 to April 27, 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: 01/27/2025 - 04/27/2025

				: 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
Red River of the North.....									
WAHPETON	11.0	13.0	15.0	: 50	53	17	23	<5	13
HICKSON	30.0	34.0	38.0	: 16	23	<5	11	<5	<5
FARGO	18.0	25.0	30.0	: 86	77	32	34	15	21

HALSTAD	26.0	32.0	37.5	27	32	10	18	<5	11
GRAND FORKS	28.0	40.0	46.0	68	56	19	28	<5	10
OSLO	26.0	30.0	36.0	75	61	61	53	9	18
DRAYTON	32.0	38.0	42.0	52	44	24	28	<5	11
PEMBINA	39.0	44.0	49.0	63	49	36	37	15	21

	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.....									
Note: The Roseau numbers consider the flow through its diversion									
SABIN	13.0	15.0	19.0	76	48	7	14	<5	<5
HAWLEY	8.0	9.0	11.0	24	30	8	21	<5	<5
DILWORTH	13.0	20.0	26.0	80	57	9	15	<5	<5
TWIN VALLEY	10.0	12.0	14.0	<5	14	<5	7	<5	<5
HENDRUM	20.0	28.0	32.0	59	42	8	15	<5	6
SHELLY	14.0	20.0	23.0	6	25	<5	10	<5	<5
CLIMAX	20.0	25.0	30.0	7	21	<5	9	<5	5
HIGH LANDING	12.0	12.5	13.0	<5	<5	<5	<5	<5	<5
CROOKSTON	15.0	20.0	23.0	40	37	9	17	<5	<5
ABOVE WARREN	67.0	71.0	75.0	<5	<5	<5	<5	<5	<5
ALVARADO	106.0	108.0	110.0	15	17	<5	9	<5	<5
HALLOCK	802.0	806.0	810.0	61	59	21	34	<5	<5
ROSEAU	16.0	18.0	19.0	5	19	<5	9	<5	<5

: 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	:	49	34	36	31	11	18
VALLEY CITY	15.0	16.0	17.0	:	<5	9	<5	6	<5	<5
LISBON	15.0	17.0	19.0	:	5	10	<5	8	<5	<5
KINDRED	16.0	19.0	20.5	:	11	14	5	10	<5	8
WEST FARGO DVRSN	18.0	20.0	21.0	:	6	11	<5	9	<5	8
HARWOOD	84.0	86.0	91.0	:	19	22	15	18	6	9
ENDERLIN	9.5	12.0	14.0	:	42	25	7	8	<5	<5
MAPLETON	18.0	21.0	23.0	:	49	32	17	14	<5	5
HILLSBORO	10.0	13.0	16.0	:	18	19	9	10	<5	<5
MINTO	6.0	8.0	11.0	:	19	19	5	8	<5	<5
WALHALLA	11.0	16.0	18.0	:	20	19	<5	<5	<5	<5
NECHE	18.0	19.0	20.5	:	39	23	34	22	17	18

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 January 27, 2025 to April 27, 2025

LOCATION	95%	90%	75%	50%	25%	10%	05%

Red River of the North.....							
WAHPETON	8.8	8.9	9.6	10.9	12.0	14.2	14.5
HICKSON	15.3	16.8	18.6	22.7	26.2	32.3	33.7
FARGO	17.1	17.4	19.4	22.4	26.4	33.6	35.1
HALSTAD	11.9	14.6	17.2	20.5	26.5	32.4	37.1
GRAND FORKS	21.2	22.6	26.5	33.0	37.9	42.0	45.5
OSLO	18.5	20.6	26.1	32.5	34.1	35.4	36.9
DRAYTON	19.6	22.2	26.4	32.1	37.6	40.5	41.2
PEMBINA	28.6	30.1	36.1	41.3	46.8	49.7	50.2

Minnesota Tribs:	95%	90%	75%	50%	25%	10%	05%
South Fork Buffalo River.....							
SABIN	11.3	12.1	13.0	13.7	14.4	14.8	16.4
Buffalo River.....							
HAWLEY	4.8	5.1	5.9	6.7	7.9	8.8	9.6
DILWORTH	10.1	11.4	13.8	16.1	18.3	19.7	22.3
Wild Rice River.....							
TWIN VALLEY	3.9	4.4	4.8	5.8	6.9	8.0	9.4
HENDRUM	11.2	15.7	18.0	20.8	24.2	27.4	30.3
Marsh River.....							
SHELLY	6.4	7.5	8.9	10.1	12.1	13.5	15.1
Sand Hill River.....							
CLIMAX	8.3	10.2	11.3	12.0	15.7	18.2	22.5
Red Lake River.....							
HIGH LANDING	3.3	3.6	4.1	5.5	7.1	9.1	9.9
CROOKSTON	9.1	9.8	11.2	14.0	16.3	19.0	22.0
Snake River.....							
ABOVE WARREN	62.4	62.5	63.1	63.8	64.8	65.7	66.1
ALVARADO	99.2	99.6	100.8	102.4	105.1	107.5	108.0
Two Rivers River.....							
HALLOCK	799.0	799.4	800.5	803.1	805.7	807.4	808.0

Roseau River..... considering the flow through the Roseau diversion

ROSEAU	7.9	8.5	9.3	10.8	13.1	15.3	16.1

North Dakota Tribs:	95%	90%	75%	50%	25%	10%	05%
Wild Rice River.....							
ABERCROMBIE	13.5	14.1	15.8	19.3	23.7	28.8	31.1
Sheyenne River.....							
VALLEY CITY	6.5	6.8	7.6	8.9	11.4	12.0	13.0
LISBON	6.2	6.4	7.5	9.0	11.2	12.4	15.5
KINDRED	7.3	7.8	9.0	11.1	13.9	16.1	19.4
WEST FARGO DVRSN	10.6	10.8	10.9	13.0	14.1	16.1	19.3
HARWOOD	74.8	75.5	77.0	79.0	82.5	87.9	91.2
Maple River.....							
ENDERLIN	5.8	6.7	7.3	8.7	10.2	11.3	13.0
MAPLETON	12.8	13.1	15.1	17.8	20.1	21.6	22.6
Goose River.....							
HILLSBORO	3.8	4.1	5.1	6.0	8.4	12.9	13.8
Forest River.....							
MINTO	3.2	3.6	4.0	4.8	5.7	7.6	8.1
Pembina River.....							
WALHALLA	5.5	6.2	7.1	8.5	10.6	12.3	14.1
NECHE	10.1	11.8	13.0	15.9	20.1	21.1	21.2

.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 is run for multiple scenarios starting at current river levels and soil conditions using 69 years (1949-2018) 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 mid February and ending in mid March, 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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www.weather.gov/fgf

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