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PROBABILISTIC HYDROLOGIC OUTLOOK

NATIONAL WEATHER SERVICE EASTERN NORTH DAKOTA/GRAND FORKS ND

1055 AM CST Thu Feb 13 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 2/17/25 to 5/18/25.

.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...

There is a high risk (greater than 65 percent chance) of moderate flooding at Oslo on the Red River.

There is a medium risk (35 to 65 percent chance) of moderate flooding at Fargo/Moorhead and Pembina on the Red River. In North Dakota, there is a medium chance 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 Wahpeton 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, 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 Halstad 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 Enderlin and 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 SOIL MOISTURE...

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 has continued into winter (exception being near the international border in North Dakota). This has allowed abnormally dry to moderate drought conditions to persist across the southern portion of the 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, has led to the formation of a deep frost layer. Frost depth values of 30 to 45 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 far northeastern portions of the Devils Lake basin and into far northeastern North Dakota where a deeper snowpack is present.

* 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...

Cold and generally dry conditions are expected to continue for the next 1 to 2 weeks. Temperatures are likely to remain well below normal for the majority of this time period.

* LONG TERM CLIMATE OUTLOOK...

Climate outlooks indicate continued below normal temperatures 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 27, 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


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Red River of the North.....
  WAHPETON      11.0  13.0  15.0 : 73 56 26 30 6 16
  HICKSON       30.0  34.0  38.0 : 24 27 6 13 <5 <5
  FARGO         18.0  25.0  30.0 : >95 81 46 40 28 26
  HALSTAD       26.0  32.0  37.5 : 41 38 17 21 <5 12
  GRAND FORKS  28.0  40.0  46.0 : 75 60 25 30 <5 11
  OSLO          26.0  30.0  36.0 : 81 63 69 56 7 18
  DRAYTON       32.0  38.0  42.0 : 59 45 32 32 <5 12
  PEMBINA      39.0  44.0  49.0 : 73 52 46 43 13 22

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: Current and Historical
: Chances of Exceeding
: Flood Categories
: as a Percentage (%)

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          Categorical :
          Flood Stages (FT) : Minor Moderate Major
Location  Minor Mod Major : CS HS CS HS CS HS
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Minnesota Tributaries.....

Note: The Roseau numbers consider the flow through its diversion

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  SABIN         13.0  15.0  19.0 : 90 57 19 17 <5 <5
  HAWLEY        8.0   9.0  11.0 : 33 39 16 25 <5 <5
  DILWORTH     13.0  20.0  26.0 : 95 67 18 21 <5 <5
  TWIN VALLEY  10.0  12.0  14.0 : 7 18 <5 8 <5 <5
  HENDRUM      20.0  28.0  32.0 : 61 51 13 19 <5 7
  SHELLY       14.0  20.0  23.0 : 9 28 <5 11 <5 6
  CLIMAX       20.0  25.0  30.0 : 11 23 <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 : 52 48 12 24 6 9
  ABOVE WARREN 67.0  71.0  75.0 : 7 10 <5 <5 <5 <5
  ALVARADO     106.0 108.0 110.0 : 25 22 8 14 <5 <5
  HALLOCK      802.0 806.0 810.0 : 65 62 23 39 <5 10

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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

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North Dakota Tributaries.....

ABERCROMBIE	20.0	22.0	28.0	:	61	40	47	34	16	19
VALLEY CITY	15.0	16.0	17.0	:	<5	10	<5	7	<5	6
LISBON	15.0	17.0	19.0	:	7	11	5	10	<5	7
KINDRED	16.0	19.0	20.5	:	19	20	9	11	5	10
WEST FARGO DVRSN	18.0	20.0	21.0	:	10	12	6	11	6	10
HARWOOD	84.0	86.0	91.0	:	27	26	25	21	7	10
ENDERLIN	9.5	12.0	14.0	:	45	26	10	11	<5	<5
MAPLETON	18.0	21.0	23.0	:	56	35	19	17	<5	5
HILLSBORO	10.0	13.0	16.0	:	23	19	10	10	<5	<5
MINTO	6.0	8.0	11.0	:	21	22	5	9	<5	<5
WALHALLA	11.0	16.0	18.0	:	18	21	<5	<5	<5	<5
NECHE	18.0	19.0	20.5	:	37	27	30	26	17	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 February 17, 2025 to May 18, 2025

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

Red River of the North.....							
WAHPETON	9.7	10.1	10.9	11.7	13.1	14.6	15.2
HICKSON	18.6	19.6	21.9	24.7	29.4	32.5	34.4
FARGO	18.5	20.2	22.0	24.5	30.5	33.4	35.9
HALSTAD	14.9	17.2	19.5	23.8	28.7	34.3	37.0
GRAND FORKS	23.9	25.0	28.0	34.4	39.9	42.5	45.5
OSLO	22.6	24.1	27.9	33.4	34.7	35.6	36.9
DRAYTON	23.2	24.2	28.6	34.0	39.2	40.2	41.5
PEMBINA	33.0	34.0	38.1	43.8	47.8	49.5	50.9
Minnesota Tribs:	95%	90%	75%	50%	25%	10%	05%

South Fork Buffalo River.....							
SABIN	12.7	13.0	13.5	14.2	14.7	15.6	16.6
Buffalo River.....							
HAWLEY	5.5	5.8	6.3	7.1	8.7	9.2	9.7
DILWORTH	12.9	13.8	15.0	17.9	19.4	21.5	22.7
Wild Rice River.....							
TWIN VALLEY	4.6	4.8	5.4	6.7	7.5	9.4	10.4
HENDRUM	13.5	15.5	17.6	21.4	25.6	28.6	29.4
Marsh River.....							
SHELLY	7.3	8.0	9.1	9.7	11.9	13.8	15.9
Sand Hill River.....							
CLIMAX	9.4	10.8	11.3	12.6	16.3	20.3	24.1
Red Lake River.....							
HIGH LANDING	3.7	4.1	4.8	6.4	7.8	9.6	10.8
CROOKSTON	10.2	10.5	12.2	15.2	17.8	20.4	23.5
Snake River.....							

ABOVE WARREN	62.8	62.9	63.2	64.1	65.2	66.3	67.8
ALVARADO	100.0	100.4	101.0	103.3	106.0	107.9	109.3
Two Rivers River.....							
HALLOCK	799.5	799.8	801.0	803.4	805.5	807.8	808.7
Roseau River.....							
ROSEAU	8.5	8.8	9.4	10.7	13.0	15.8	16.0
North Dakota Tribs: 95% 90% 75% 50% 25% 10% 05%							

Wild Rice River.....							
ABERCROMBIE	14.6	15.6	18.4	21.7	26.1	28.7	31.3
Sheyenne River.....							
VALLEY CITY	6.6	7.0	7.9	9.4	11.5	12.5	13.0
LISBON	6.3	6.7	7.7	9.2	11.8	13.3	17.0
KINDRED	8.0	8.3	9.4	11.6	14.8	18.7	20.5
WEST FARGO DVRSN	10.8	10.9	11.1	13.0	15.1	18.5	21.3
HARWOOD	75.5	76.4	77.7	80.1	85.9	89.8	91.4
Maple River.....							
ENDERLIN	6.4	7.2	8.1	9.3	10.9	12.0	13.3
MAPLETON	13.2	14.2	16.4	18.9	20.8	22.0	22.7
Goose River.....							
HILLSBORO	4.2	4.5	5.4	6.9	9.3	13.1	13.9
Forest River.....							
MINTO	3.5	3.6	4.0	4.6	5.5	7.2	8.0
Pembina River.....							
WALHALLA	5.9	6.2	6.9	8.3	10.1	13.1	14.0
NECHE	10.8	11.5	12.6	16.2	19.6	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 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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