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Probabilistic Hydrologic Outlook
National Weather Service Eastern North Dakota/Grand Forks ND
1114 AM CST Thu Mar 01 2018

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

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

.Discussion...

   The threat for significant snowmelt flooding remains low across
the main-stem Red River and all sub-basins. Abnormally dry conditions
have persisted across the basin since February 2017 and could
continue into spring 2018. Soil moisture, streamflow, and snowpack in
all sub-basins are near to below normal. Predictions for the
remaining winter and early spring should trend to near normal
temperatures and near to above normal precipitation.

   The Red River main-stem has seen a slight uptick on the high end
probabilistic chances due to an increased snowpack across the central
basin. Minnesota tributaries have also seen a slight uptick with more
normal snowfall the past two weeks while the North Dakota tributaries
show no appreciable change due to the continued dry Upper Sheyenne
Basin and relatively low snowpack.

   Lastly, a significant winter storm is possible across the region
late this weekend and early next week (March 3rd and 4th). This
system has the potential to bring (liquid) precipitation amounts of
one-half of an inch to an inch (or more) to parts of the area.
However, due to the current dry conditions, this precipitation is
expected to more than likely maintain the near normal flood risk
rather than greatly increase it.

  Probabilistic Hydrologic Outlooks now use 64 years (1949-2012)
    of past weather, temperature, and precipitation for the
    ensemble predictive hydrographs used in calculating the
    probabilities of exceeding a river level for the valid period
    of the outlook.

  Outlook Schedule - The National Weather Service in Grand Forks,
    North Dakota will be providing the Advanced Hydrologic
    Prediction Services (AHPS) Long-Range Probabilistic Hydrologic
    Outlooks for the Red River of the North and its Minnesota and
    North Dakota tributaries according to the following schedule:

    - near the end of the month throughout the year, except for...

- The Spring Flood and Water Resources Outlooks that will be
        issued at least twice a month during the spring snow melt
        season beginning in mid-to-late February or early March.

   The following message has three river data sections:

      - The first (Table 1) gives the current and normal/historical
        chances of river locations reaching their minor, moderate,
        and major flood category.

      - The second (Table 2) gives the current chances of river
        locations rising above the river stages listed.

      - The third (Table 3) gives the current chances of river
        locations falling below the river stages listed.

.Red River Long-Range Probabilistic Outlook by Flood Category...
            Valid from March 11, 2018 to June 02, 2018.

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: 03/11/2018 - 06/02/2018

                                         : 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 : 44 59   12 28   <5 13
  HICKSON   30.0   34.0   38.0 : 10 25   <5 12   <5 <5
  FARGO   18.0   25.0   30.0 : 78 81   27 40   9 26
  HALSTAD   26.0   32.0   37.5 : 20 35   8 20   <5 11
  GRAND FORKS   28.0   40.0   46.0 : 63 57   16 33   5 11
  OSLO   26.0   30.0   36.0 : 76 63   61 56   6 20
  DRAYTON   32.0   38.0   42.0 : 39 50   23 35   5 12
  PEMBINA   39.0   44.0   49.0 : 51 55   28 43   6 23

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                                    : 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
--------               ------ ------ ------ : --- ---  --- ---   --- ---
Minnesota Tributaries.....
  SABIN                 13.0   15.0   19.0 :  81  53   12  17    <5  <5
  HAWLEY                 8.0    9.0   11.0 :  25  36   12  24    <5  <5
  DILWORTH              13.0   20.0   26.0 : >95  66   12  20    <5  <5
  TWIN VALLEY           10.0   12.0   14.0 :  <5  17   <5   6    <5  <5
  HENDRUM               20.0   28.0   32.0 :  52  54    8  23    <5   6
  SHELLY                14.0   20.0   23.0 :  17  30   <5  11    <5  <5
  CLIMAX                20.0   25.0   30.0 :   6  27   <5  12    <5   7
  HIGH LANDING          12.0   12.5   13.0 :   6  18   <5  17    <5  13
  CROOKSTON             15.0   23.0   25.0 :  41  45   <5  11    <5   8
  ABOVE WARREN          67.0   71.0   75.0 :   7  13   <5  <5    <5  <5
  ALVARADO             106.0  108.0  110.0 :   9  19    6  15    <5  <5
  HALLOCK              802.0  806.0  810.0 : >95  57   51  42    <5  10
  ROSEAU                16.0   18.0   19.0 :   7  18   <5   7    <5  <5
   Note: The Roseau numbers consider the flow thru its diversion


                                    : 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           10.0   12.0   18.0 :  43  37   34  33     8  20
  VALLEY CITY           15.0   16.0   17.0 :  <5  10   <5   9    <5   6
  LISBON                15.0   17.0   19.0 :   6  11   <5   9    <5   6
  KINDRED               16.0   19.0   20.5 :   7  20    5  13    <5   9
  WEST FARGO DVRSN      18.0   20.0   21.0 :   9  23    7  17     6  13
  HARWOOD              884.0  886.0  891.0 :  14  24    8  22     5  11
  ENDERLIN               9.5   12.0   14.0 :  17  21    6  10    <5  <5
  MAPLETON             905.0  908.0  910.0 :  18  34    7  14    <5  <5
  HILLSBORO             10.0   13.0   16.0 :  12  15    5   9    <5  <5
  MINTO                  6.0    8.0   11.0 :  17  32    7  11    <5  <5
  GRAFTON               12.0   13.5   14.5 :   7  22   <5   9    <5   6
  WALHALLA              11.0   16.0   18.0 :  <5  19   <5  <5    <5  <5
  NECHE                 18.0   19.0   20.5 :  <5  28   <5  26    <5  19


LEGEND:
    CS  =  Conditional Simulation (Outlook for current conditions)
    HS  =  Historical  Simulation ( "         "  normal  conditions)
    ft  =  feet                    (above gage zero datum)


.Probabilities for Rising Above Listed River Stages...
                from  03/11/2018 to 06/02/2018
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In Table 2 below, the 95 through 5 percent columns indicate the
  probability of exceeding the listed stage levels (ft) for the
   valid time period at the location listed.

   Interpretation Aid: The flood stage for Wahpeton on the Red
    River of the North is 11 feet. There is a 50 percent chance
     that it will rise above 10.6 feet and only a 10 percent chance
      that it will rise above 13.3 feet.

...Table 2--Exceedance Probabilities...

Chance of Exceeding Stages
at Specific Locations
Valid Period: 03/11/2018 - 06/02/2018

LOCATION	95%	90%	75%	50%	25%	10%	05%
Red River of the North.....							
WAHPETON	7.0	8.3	9.2	10.6	12.2	13.3	14.7
HICKSON	14.0	15.7	18.4	20.5	25.7	30.5	32.5
FARGO	16.4	17.0	18.3	20.2	25.7	28.9	34.0
HALSTAD	13.2	13.6	16.1	20.4	25.4	30.2	34.8
GRAND FORKS	21.5	21.9	26.2	31.7	37.0	41.5	46.3
OSLO	20.3	20.9	26.5	31.9	34.1	35.2	37.2
DRAYTON	21.1	21.7	26.2	30.9	37.3	39.5	42.0
PEMBINA	29.5	30.2	35.6	39.3	45.1	47.6	50.9

Minnesota Tribs:	95%	90%	75%	50%	25%	10%	05%
South Fork Buffalo River.....							
SABIN	12.8	12.8	13.1	13.7	14.6	15.3	16.1
Buffalo River.....							
HAWLEY	5.1	5.4	5.8	6.7	8.0	9.2	9.4
DILWORTH	13.2	13.7	14.8	17.0	19.4	20.3	21.9
Wild Rice River.....							
TWIN VALLEY	4.5	4.9	5.2	6.0	6.9	8.6	9.5
HENDRUM	14.5	15.8	17.6	20.4	23.9	27.4	29.4
Marsh River.....							
SHELLY	8.4	8.8	9.4	10.5	11.9	17.8	18.8
Sand Hill River.....							
CLIMAX	9.0	10.0	11.1	11.7	13.5	19.1	24.2
Red Lake River.....							
HIGH LANDING	4.8	5.1	6.2	7.2	9.2	10.8	12.1
CROOKSTON	9.4	9.7	11.8	14.2	16.6	20.1	22.6
Snake River.....							
ABOVE WARREN	62.9	63.1	63.3	64.0	64.8	66.3	67.6
ALVARADO	99.4	99.6	100.2	101.5	104.0	105.7	108.6
Two Rivers River.....							
HALLOCK	803.6	804.3	804.8	806.0	807.5	808.5	809.3
Roseau River..... considering the flow thru the Roseau diversion							
ROSEAU	10.9	11.1	11.5	12.6	14.5	15.7	16.4

North Dakota Tribs:	95%	90%	75%	50%	25%	10%	05%

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Wild Rice River.....
  ABERCROMBIE        2.6    3.6    5.2    9.2   14.1   17.3   19.4
Sheyenne River.....
  VALLEY CITY        6.0    6.2    7.1    8.3    9.6   11.7   13.0
  LISBON             5.3    5.6    6.6    8.1   10.3   12.2   16.9
  KINDRED            6.2    6.7    7.9    9.9   12.6   15.2   19.5
  WEST FARGO DVRSN  12.2   12.4   13.0   14.3   16.1   17.6   22.5
  HARWOOD          874.7  874.9  876.1  878.0  880.3  884.8  891.0
Maple River.....
  ENDERLIN           6.0    6.3    7.1    8.1    9.1   10.4   12.4
  MAPLETON         898.6  899.1  900.2  902.1  904.2  906.6  908.5
Goose River.....
  HILLSBORO          4.2    4.4    4.8    5.9    8.0   11.1   13.4
Forest River.....
  MINTO              2.6    2.7    3.1    4.3    5.3    7.3    8.5
Park River.....
  GRAFTON            8.3    8.5    8.7    8.9    9.6   11.4   12.8
Pembina River.....
  WALHALLA           2.9    3.0    3.5    4.2    5.7    7.9    8.1
  NECHE              4.7    4.9    5.8    7.1    9.6   14.0   15.7
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.Probabilities for Falling Below Listed River Stages...
            from 03/11/2018 to 06/02/2018

In Table 3 below, the 95 through 5 percent columns indicate the
  probability of falling below the listed stage levels (ft) for
   the valid time period at the location listed.

  Interpretation Aid: The flood stage for Wahpeton on the Red
   River of the North is 11 feet. There is a 50 percent chance
    that it will fall below 4.7 feet and only a 10 percent chance
     that it will fall below 4.1 feet.

...Table 3--Non-Exceedance Probabilities...

                    Chance of Not Exceeding Stages
                        at Specific Locations
                  Valid Period: 03/11/2018 - 06/02/2018


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LOCATION           95%    50%    75%    50%    25%    10%    05%
--------           ------ ------ ------ ------ ------ ------ ------
Red River of the North.....
  WAHPETON           4.9    4.8    4.8    4.7    4.6    4.1    3.6
  HICKSON           10.7   10.7   10.7   10.6   10.5   10.3   10.1
  FARGO             14.7   14.6   14.5   14.4   14.4   14.3   14.2
  HALSTAD            4.6    4.5    4.3    4.1    4.0    3.9    3.8
  GRAND FORKS       15.6   15.6   15.5   15.4   15.3   15.3   15.3
  OSLO               6.6    6.6    6.5    5.8    5.4    5.4    5.3
  DRAYTON           11.4   11.4   11.4   11.4   11.2   11.2   11.2
  PEMBINA            7.7    7.7    7.7    7.7    7.3    7.2    7.1


Minnesota Tribs:   95%    90%    75%    50%    25%    10%    05%
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South Fork Buffalo River.....
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    SABIN              5.2    5.2    5.2    5.2    5.2    5.1    5.1
Buffalo River.....
    HAWLEY             3.3    3.3    3.3    3.3    3.3    3.3    3.3
    DILWORTH           3.5    3.5    3.5    3.5    3.5    3.4    3.4
Wild Rice River.....
    TWIN VALLEY        2.2    2.2    2.2    2.1    2.1    2.0    1.9
    HENDRUM            2.0    2.0    2.0    2.0    1.9    1.9    1.9
Marsh River.....
    SHELLY             3.8    3.8    3.8    3.8    3.8    3.8    3.8
Sand Hill River.....
    CLIMAX             3.8    3.8    3.8    3.7    3.7    3.7    3.7
Red Lake River.....
    HIGH LANDING       0.7    0.7    0.7    0.7    0.7    0.7    0.7
    CROOKSTON          2.5    2.5    2.5    2.4    2.4    2.4    2.3
Snake River.....
    ABOVE WARREN      60.7   60.7   60.7   60.7   60.7   60.7   60.7
    ALVARADO          95.9   95.9   95.8   95.8   95.8   95.8   95.8
Two Rivers River.....
    HALLOCK          792.7  792.7  792.6  792.6  792.6  792.6  792.6
Roseau River..... considering the flow thru the Roseau diversion
    ROSEAU             4.7    4.6    4.6    4.6    4.5    4.5    4.5


North Dakota Tribs:   95%    90%    75%    50%    25%    10%    05%
--------            ------ ------ ------ ------ ------ ------ ------
Wild Rice River.....
    ABERCROMBIE        0.1    0.1    0.1    0.1    0.1   -0.0   -0.3
Sheyenne River.....
    VALLEY CITY        3.6    3.6    3.5    3.5    3.5    3.5    3.5
    LISBON             2.7    2.7    2.4    2.4    2.3    2.3    2.3
    KINDRED            2.2    2.2    2.2    2.2    2.2    2.2    2.2
    WEST FARGO DVRSN   9.2    9.2    9.2    9.2    9.2    9.2    9.2
    HARWOOD          866.0  866.0  866.0  866.0  866.0  866.0  866.0
Maple River.....
    ENDERLIN           1.7    1.7    1.7    1.7    1.7    1.7    1.7
    MAPLETON         894.4  894.4  894.4  894.4  894.4  894.3  894.3
Goose River.....
    HILLSBORO          1.7    1.7    1.7    1.7    1.7    1.7    1.6
Forest River.....
    MINTO              1.3    1.3    1.3    1.3    1.3    1.3    1.2
Park River.....
    GRAFTON            7.1    7.1    7.1    7.1    7.1    7.1    7.1
Pembina River.....
    WALHALLA           1.4    1.4    1.4    1.4    1.4    1.2    1.2
    NECHE              2.0    2.0    2.0    2.0    2.0    1.8    1.7
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.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, snow and
 soil conditions using over 60 years 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. 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 Impact-Based Decision Support Services
that help with long-range flood planning and response readiness. This
outlook is a part of NOAA's National Weather Service AHPS (Advanced
Hydrologic Prediction Services).

This outlook was produced using precipitation and temperatures
 for the years 1949 through 2012.

.ADDITIONAL INFORMATION SOURCES...

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, together with explanations that help in
 interpreting them, are available from the NWS Grand Forks AHPS web
 page on the internet at:

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

 then click on "Rivers and Lakes" 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 web site. Also, 7-day deterministic forecasts
 will be issued at least once a day when the river forecast
 locations will be at or above flood during that period.

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

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

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