



Minnesota Department of Natural Resources
Division of Ecological and Water Resources



Hydrologic Conditions Report

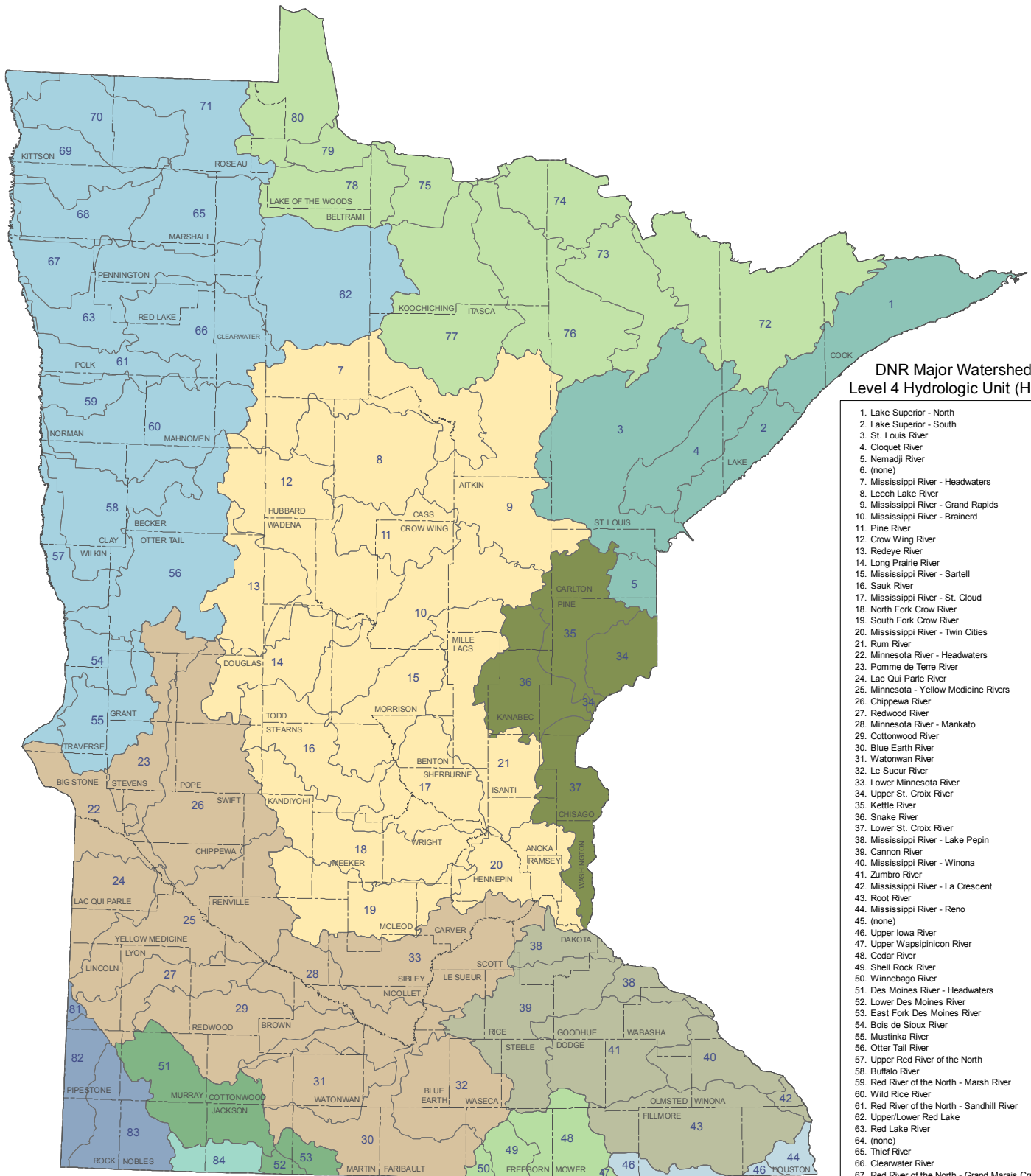
August 2021

Previous reports at: https://www.dnr.state.mn.us/current_conditions/hydro_conditions.html

- August 2021 brought some welcome relief to the drought across the central and southern parts of the state. Precipitation totals were from one to three inches above normal over many places in the south. Parts of northwest Minnesota also saw a surplus of precipitation. Northeast Minnesota in general fell short of normal. The National Weather Service cooperative observer at La Crescent (far southeastern Minnesota) recorded the highest monthly rainfall total, with 11.85 inches. One of the lower totals was the Duluth International Airport with 2.44 inches or 1.29 inches short of normal. In general, the average station in the state had around five inches of precipitation. The August 31 U. S. Drought Monitor map depicts 8% of the state in the Abnormally Dry category, 23% in the Moderate Drought category, 27% in the Severe Drought category, 31% in the Extreme Drought category and 7% in the Exceptional Drought category. Beginning with the August 10 Drought Monitor, this was the first time since the inception of the U.S. Drought Monitor in 2000 that the Exceptional Drought intensity was reported. The U.S. Drought Monitor index is a blend of science and subjectivity where drought categories (Moderate, Severe, etc.) are based on several indicators.
- A majority of stream gages throughout the state used in this report were ranked Below Normal (10-25th percentile) and Low ($\leq 10^{\text{th}}$ percentile) for August of this year. There was a decrease in the number of gages ranking lower than normal when compared to last month. 27 watersheds are Low, 16 are Below Normal, 35 are Normal (25th-75th percentile), and 3 are High ($> 90^{\text{th}}$ percentile). One gage did not have discharge data available because it's still affected by backwater.
- Seven of the 20 lakes surveyed in the Lake Level Status map are now showing Low percentiles and one is showing Below Normal percentiles in August. Eleven of the 20 lakes presented in the Normal percentile. One lake is back to a High percentile in August following rains; two lakes did not report for August. Lakes in Aitkin, Anoka, Becker, Beltrami, Carver, Cook, Crow Wing, Hubbard, Isanti, Meeker, Morrison, Otter Tail, Washington and Wright Counties reached their lowest reported lake level in August. Thirty-nine percent of the statewide reporting lakes were at Low percentiles, with 23% at Below Normal percentiles, when comparing August 2021 lake levels to their entire historic record. Thirty-three percent of the statewide reporting lakes were still at a Normal percentile, with five percent at High or Above Normal percentiles. From this statewide group of lakes, 75% are now below their average lake level for the entire historic record, while 16% were above their average.
- For the month of August, 191 of the 333 total groundwater observation wells reported water level measurements. Two percent of reporting wells ranked as High water level ($> 90^{\text{th}}$ percentile). Three percent of wells ranked Above Normal water level (75th to 90th percentile). Nineteen percent of wells ranked Normal water level (25th to 75th percentile). Twenty-five percent of wells were ranked Below Normal (10th to 25th percentile). Fifty-one percent of wells were ranked Low water level ($\leq 10^{\text{th}}$ percentile).

The information in this report is provided by DNR through long term programs committed to recording and tracking the long term status of our water resources. The current conditions of precipitation, stream flows, lake levels, and groundwater levels in this report provide valuable information for natural and economic resource management on a state, county, and watershed level. If you have questions on the content of this report please contact DNR Climatology Office: climate@umn.edu













Minnesota Counties and Major Watershed Index



DNR Major Watershed - Level 4 Hydrologic Unit (HUC8)

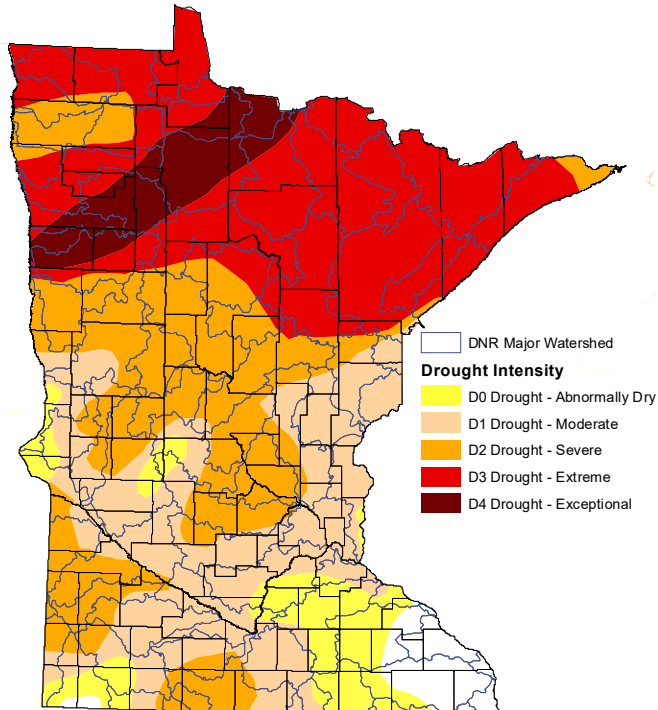
1. Lake Superior - North
2. Lake Superior - South
3. St. Louis River
4. Cloquet River
5. Nemadji River
6. (none)
7. Mississippi River - Headwaters
8. Leech Lake River
9. Mississippi River - Grand Rapids
10. Mississippi River - Brainerd
11. Pine River
12. Crow Wing River
13. Redeye River
14. Long Prairie River
15. Mississippi River - Sartell
16. Sauk River
17. Mississippi River - St. Cloud
18. North Fork Crow River
19. South Fork Crow River
20. Mississippi River - Twin Cities
21. Rum River
22. Minnesota River - Headwaters
23. Pomme de Terre River
24. Lac Qui Parle River
25. Minnesota - Yellow Medicine Rivers
26. Chippewa River
27. Redwood River
28. Minnesota River - Mankato
29. Cottonwood River
30. Blue Earth River
31. Watonwan River
32. Le Sueur River
33. Lower Minnesota River
34. Upper St. Croix River
35. Kettle River
36. Snake River
37. Lower St. Croix River
38. Mississippi River - Lake Pepin
39. Cannon River
40. Mississippi River - Winona
41. Zumbro River
42. Mississippi River - La Crescent
43. Root River
44. Mississippi River - Reno
45. (none)
46. Upper Iowa River
47. Upper Wapsipinicon River
48. Cedar River
49. Shell Rock River
50. Winnebago River
51. Des Moines River - Headwaters
52. Lower Des Moines River
53. East Fork Des Moines River
54. Bois de Sioux River
55. Mustinka River
56. Otter Tail River
57. Upper Red River of the North
58. Buffalo River
59. Red River of the North - Marsh River
60. Wild Rice River
61. Red River of the North - Sandhill River
62. Upper/Lower Red Lake
63. Red Lake River
64. (none)
65. Thief River
66. Clearwater River
67. Red River of the North - Grand Marais Creek
68. Snake River
69. Red River of the North - Tamarac River
70. Two Rivers
71. Roseau River
72. Rainy River - Headwaters
73. Vermilion River
74. Rainy River - Rainy Lake
75. Rainy River - Black River
76. Little Fork River
77. Big Fork River
78. Rapid River
79. Rainy River - Baudette
80. Lake of the Woods
81. Upper Big Sioux River
82. Lower Big Sioux River
83. Rock River
84. Little Sioux River

Level 2 Hydrologic Unit (HUC4)

- | | |
|---|--|
|  Cedar River |  Missouri - Big Sioux Rivers |
|  Des Moines River |  Missouri - Little Sioux Rivers |
|  Lower Mississippi River |  Rainy River |
|  Minnesota River |  Red River of the North |
|  Mississippi - Upper Iowa Rivers |  St. Croix River |
|  Mississippi River - Headwaters |  Western Lake Superior |

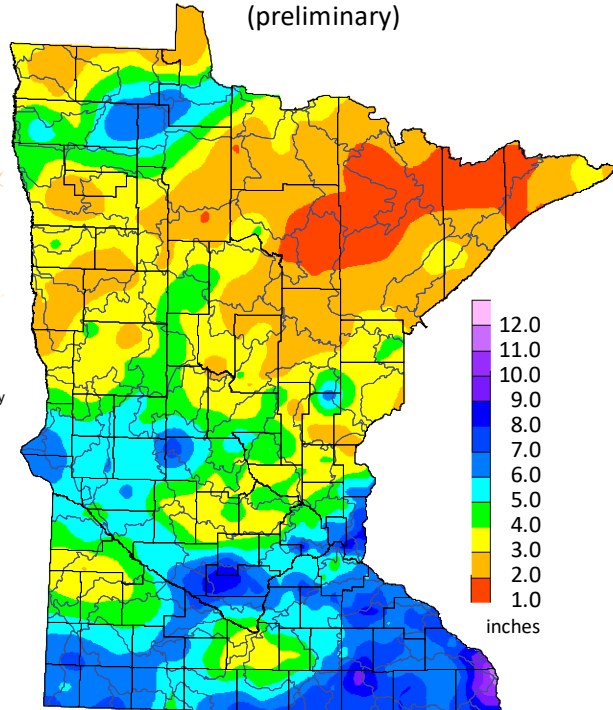
Climatology

U.S. Drought Monitor
August 31, 2021



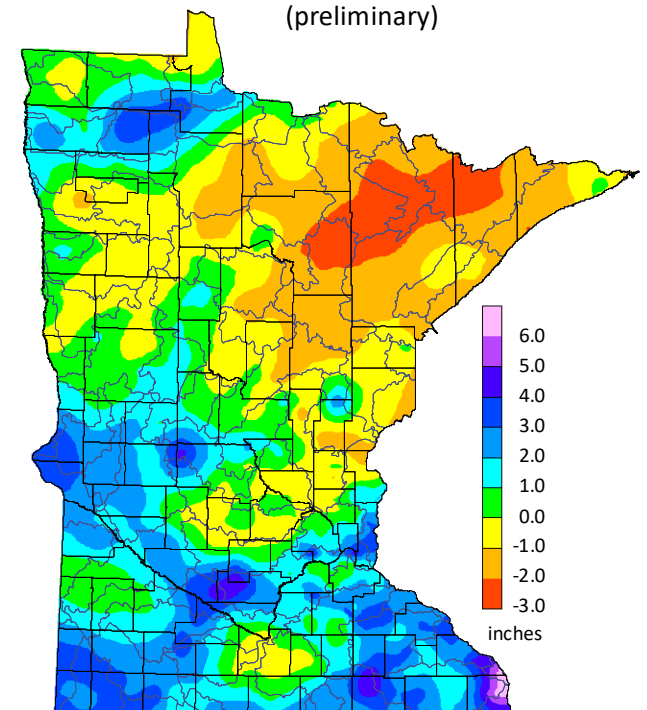
Total Precipitation
August 2021

(preliminary)

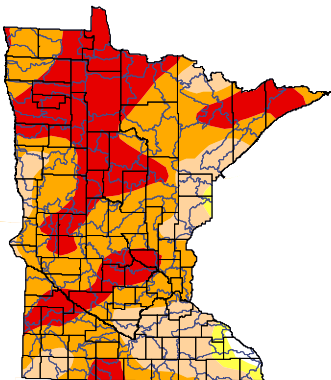


Total Precipitation
Departure from Normal:
August 2021

(preliminary)



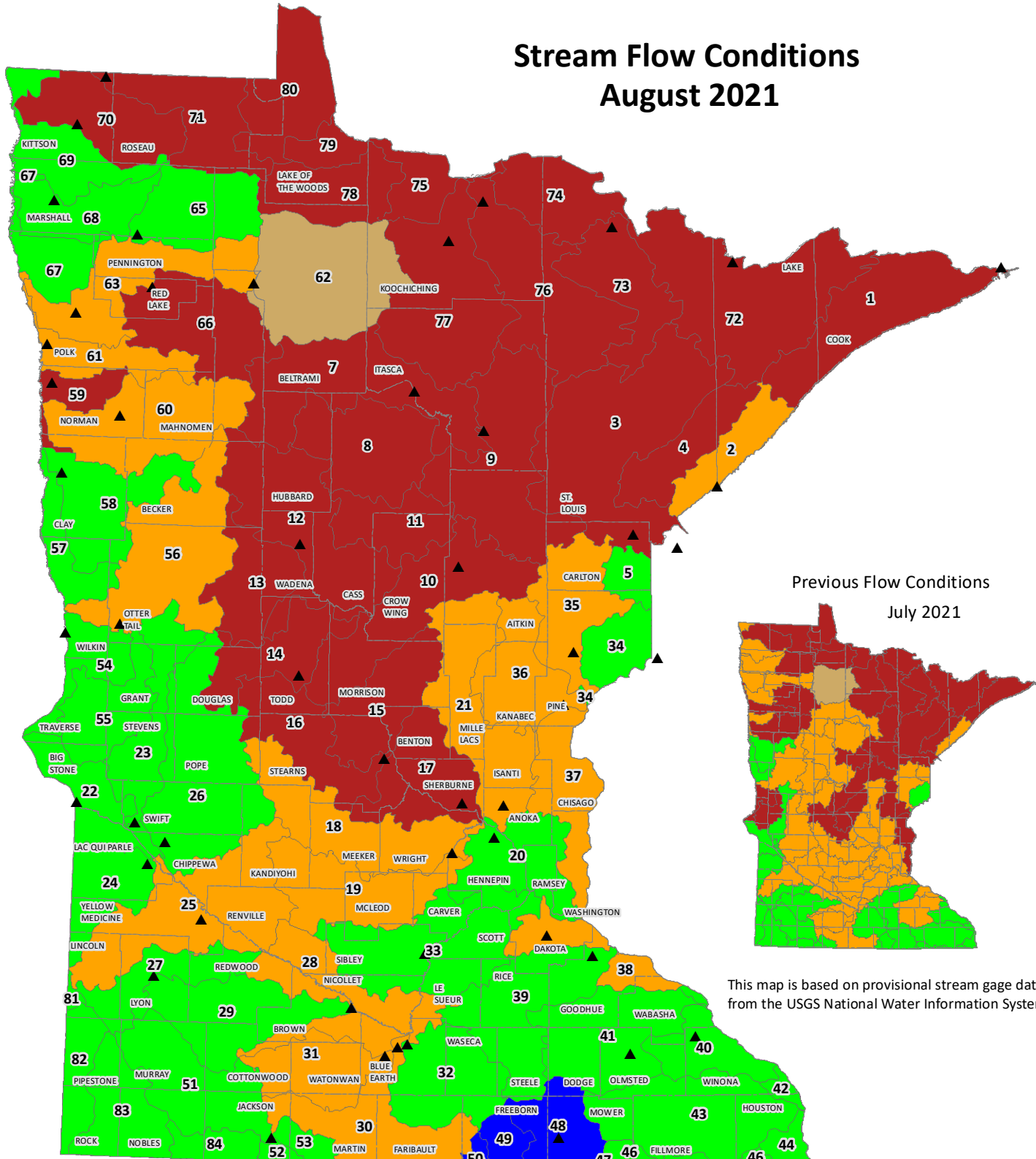
August 3, 2021



August 2021 brought some welcome relief to the drought across the central and southern parts of the state. Precipitation totals were from one to three inches above normal over many places in the south. Parts of northwest Minnesota also saw a surplus of precipitation. Northeast Minnesota in general fell short of normal. The National Weather Service cooperative observer at La Crescent (far southeastern Minnesota) recorded the highest monthly rainfall total, with 11.85 inches. One of the lower totals was the Duluth International Airport with 2.44 inches or 1.29 inches short of normal. In general, the average station in the state had around five inches of precipitation. The August 31 U. S. Drought Monitor map depicts 8% of the state in the Abnormally Dry category, 23% in the Moderate Drought category, 27% in the Severe Drought category, 31% in the Extreme Drought category and 7% in the Exceptional Drought category. Beginning with the August 10 Drought Monitor, this was the first time since the inception of the U.S. Drought Monitor in 2000 that the Exceptional Drought intensity was reported. The U.S. Drought Monitor index is a blend of science and subjectivity where drought categories (Moderate, Severe, etc.) are based on several indicators.

Surface Water: Stream Flow

Stream Flow Conditions August 2021



Previous Flow Conditions
July 2021

This map is based on provisional stream gage data from the USGS National Water Information System

▲ Designated major watershed gage

* Percentile ranking based on mean daily flows for the current month averaged and ranked with all historical mean daily flows for that month.

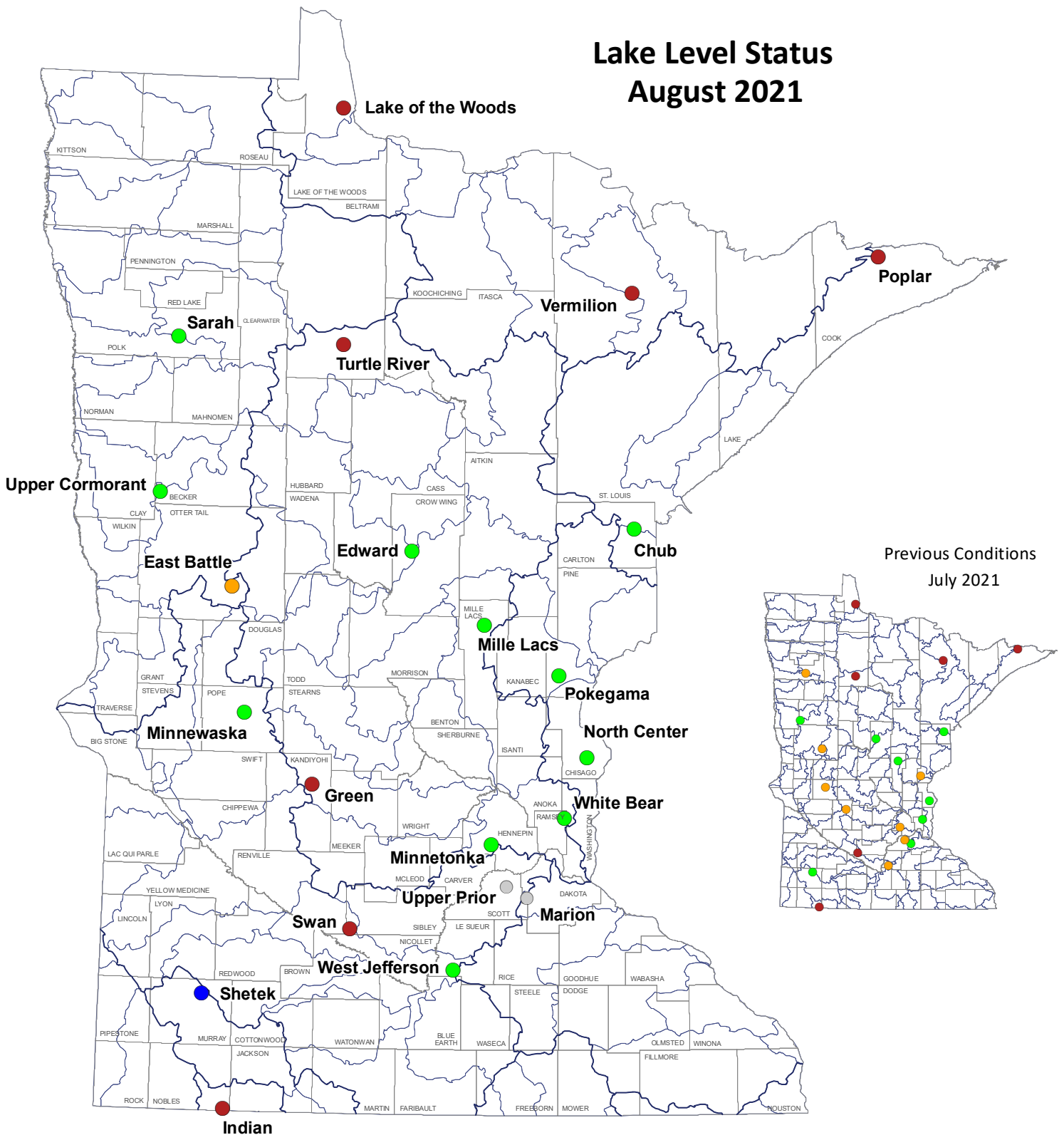
A watershed ranked at zero means that the present month flow is the lowest in the period of record; a ranking of 100 indicates the highest in the period of record.

A rating at the 50th percentile (median) specifies that the present-month flow is in the middle of the historical distribution.

- High Flows (>90th percentile)
- Above Normal Flows (75 - 90th percentile)
- Normal Flows (25 - 75th percentile)
- Below Normal Flows (10 - 25th percentile)
- Low Flows (<= 10th percentile)
- Flow affected by ice
- Flow affected by backwater
- Rating being developed or revised
- No Data

Surface Water: Lake Levels

Lake Level Status August 2021

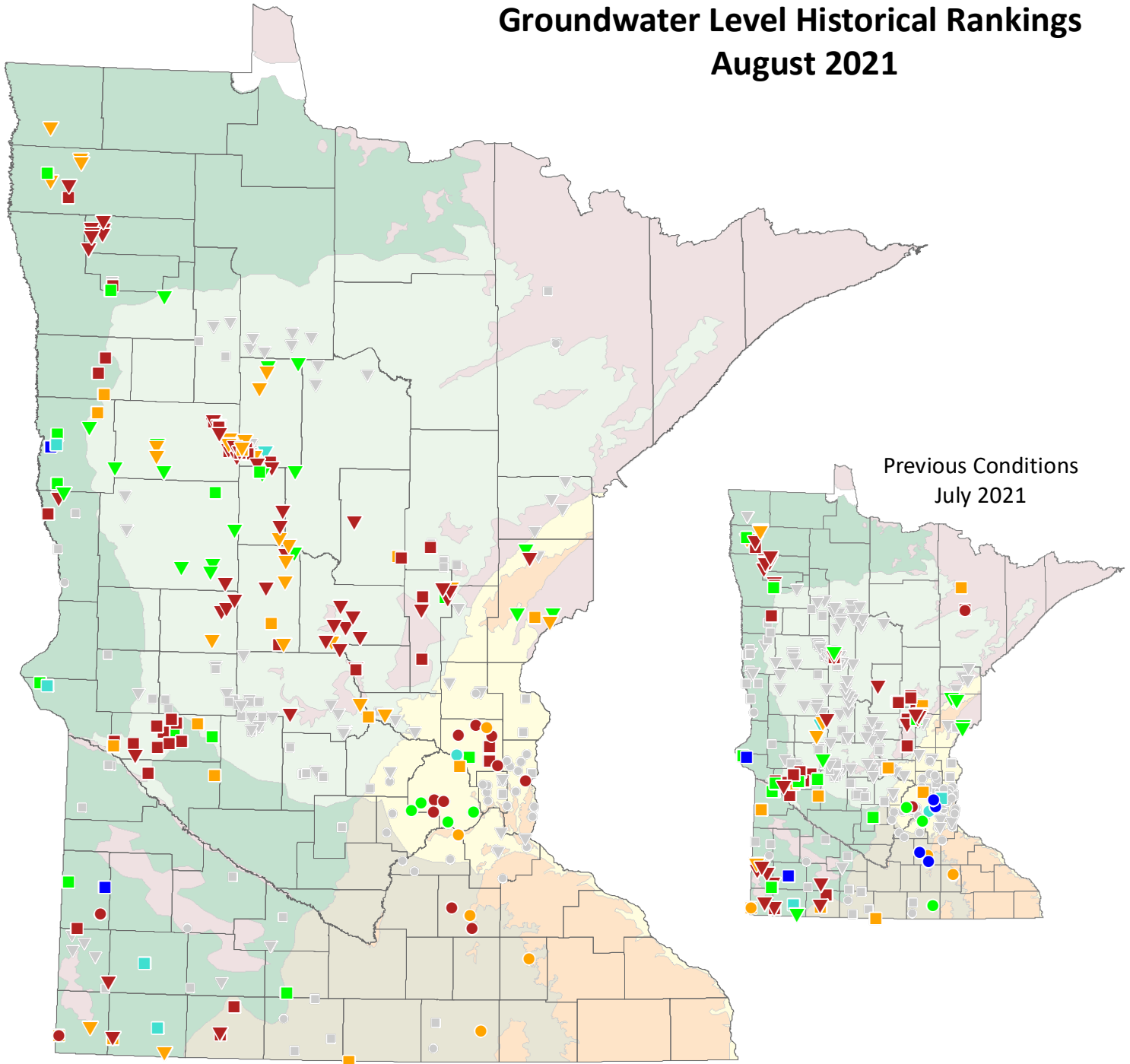


Percentile *

- High Water Levels (>90th percentile)
- Above Normal Water Levels (75 - 90th percentile)
- Normal Water Levels (25 - 75th percentile)
- Below Normal Water Levels (10 - 25th percentile)
- Low Water Levels (<= 10th percentile)
- No reading available
- Level 2 Hydrologic Unit
- DNR Major Watershed

* Percentile ranking based on last reported reading for the current month compared to all historical reported levels for that month. A lake ranked at zero means that the present reported level is the lowest in the period of record; a ranking of 100 indicates the highest in the period of record. A ranking at the 50th percentile (median) specifies that the present-month reported lake level is in the middle of the historical distribution.

Groundwater Level Historical Rankings August 2021



Minnesota Groundwater Provinces 2021

- East-central
- Central
- South-central
- Western
- Karst
- Arrowhead-shallow bedrock

* Percentile ranking based on last reported reading for the current month compared to all historical reported levels for that month. A water level ranked at zero means that the present reported level is the lowest in the period of record; a ranking of 100 indicates the highest in the period of record. A ranking at the 50th percentile (median) specifies that the present month reported water level is in the middle of the historical distribution.

Source data from: MN DNR Groundwater Level Monitoring Program

Percentile *

- High Water Levels (>90th percentile)
- Above Normal Water Levels (75 - 90th percentile)
- Normal Water Levels (25 - 75th percentile)
- Below Normal Water Levels (10 - 25th percentile)
- Low Water Levels (<= 10th percentile)
- No reading available

Aquifer Type

- Water Table
- Bedrock
- Buried Artesian