



Minnesota Department of Natural Resources  
Division of Ecological and Water Resources



## Hydrologic Conditions Report

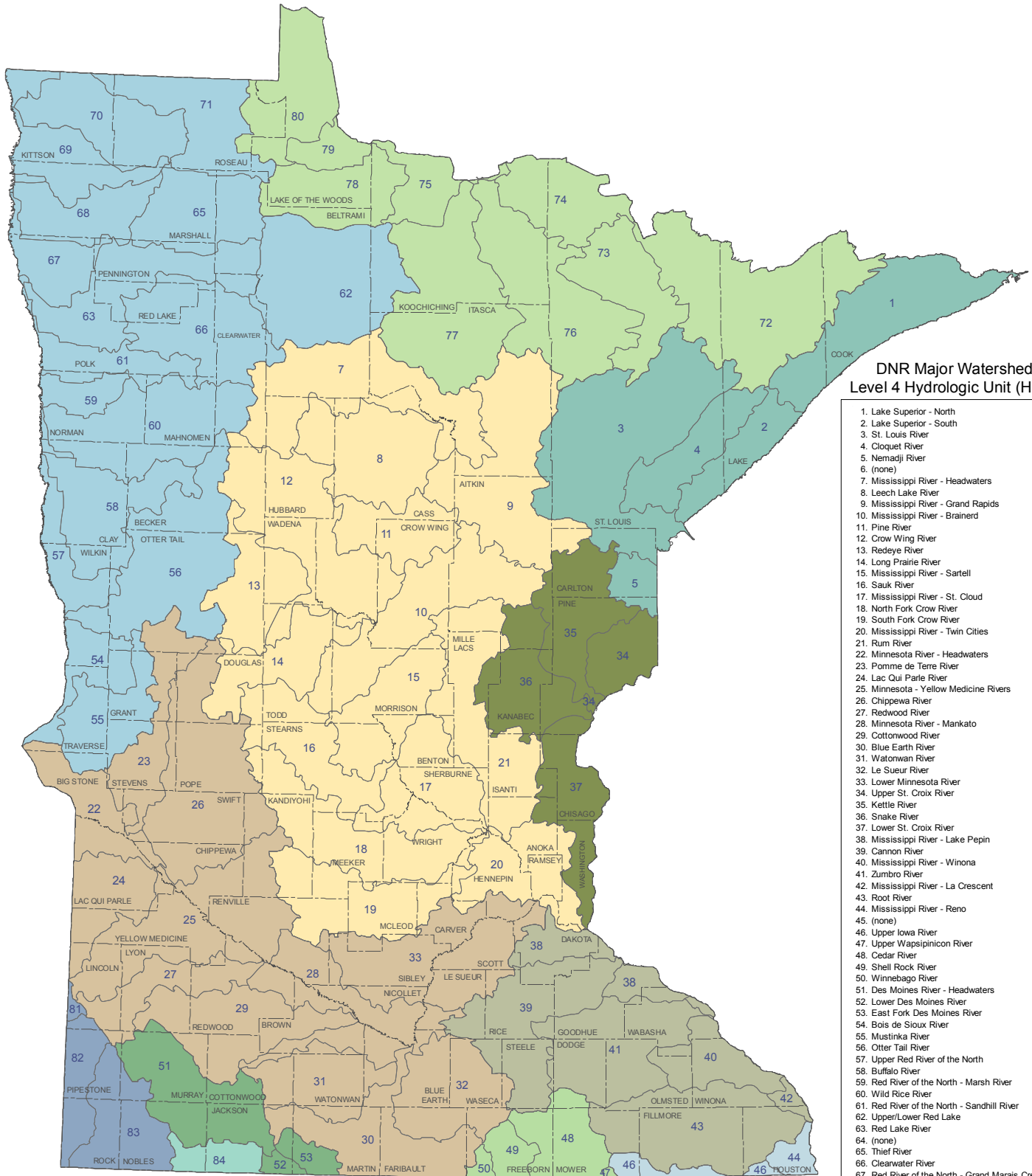
August 2019

Previous reports at: [https://www.dnr.state.mn.us/current\\_conditions/hydro\\_conditions.html](https://www.dnr.state.mn.us/current_conditions/hydro_conditions.html)

- Precipitation was highly variable across the state in August 2019, depending upon where the thunderstorms fell. There were pockets that had above normal precipitation. Cass Lake in north central Minnesota recorded 4.99 inches of precipitation, which is 2.02 inches above normal. The town of Morris in west central Minnesota recorded 5.53 inches, which is 2.20 inches above normal. One of the wettest locations in the state was Stillwater in east central Minnesota that had 7.96 inches or 3.15 inches above normal. On the other end of the spectrum was the station 7 miles northwest of Two Harbors that finished with 1.99 inches of precipitation that is 1.75 inches short of normal. Rochester also recorded 1.54 inches for August 2019, which is 2.98 inches below normal. Rochester has been very wet this year and August was the first month since March that was below normal. The preliminary statewide average was 3.25 inches or 0.67 inches below normal. The U. S. Drought Monitor map released on September 5 depicts 9.8 percent of the state in the Abnormally Dry category, confined to northwest Minnesota. One year ago, 27 percent of the state had Abnormally Dry conditions and 7 percent of the state was categorized to be in Moderate Drought. The U.S. Drought Monitor index is a blend of science and subjectivity where drought categories (Moderate, Severe, etc.) are based on several indicators.
- The overall trend continues: higher than normal flows in the south and mostly normal flows in the north. In the north, watersheds 3, 4, 73, 74, 76 ranked at Below Normal (10-25<sup>th</sup> percentile). This area is also noted as "Abnormally Dry" on the September 5<sup>th</sup> Drought Monitor.
- When comparing August 2019 lake levels to their entire historic record, 52% of the lakes with reported lake levels are in the Normal percentile, 32% are Above Normal, and 16% are Below Normal. Fifty-three percent of gaged lakes still showed August lake elevations above their average lake level of the entire historic record. Over half of these "above average" lakes reported August lake elevations more than ½ foot higher than their average. Two lakes in Morrison and Scott Counties reached their highest reported August lake level this year. Eleven of the 23 selected lakes in this report showed High or Above Normal percentiles in August. Four lakes in NE and South Central Minnesota showed Below Normal percentiles again for this month.
- Groundwater levels for August 2019 remain relatively high in our indicator well network across much of Minnesota, especially in the southern half of the state. Six well locations report High (> 90<sup>th</sup> percentile) water levels, and all but five reporting locations show water levels at Normal (25-75<sup>th</sup> percentile) or higher level. Those five wells that are below normal water level or at low water level are in the northwest portion of the state and in locations where precipitation in August is at or below normal levels. All but one of the indicator wells in Minnesota had water levels that remained the same or declined from July 2019 to August 2019. Declines are not a surprise late in this summer because of seasonal drawdown and precipitation amounts that were about 0.67 inches below normal in August of 2019.

*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 ground water 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](mailto:climate@umn.edu)*

# Minnesota Counties and Major Watershed Index



## DNR Major Watershed - Level 4 Hydrologic Unit (HUC8)

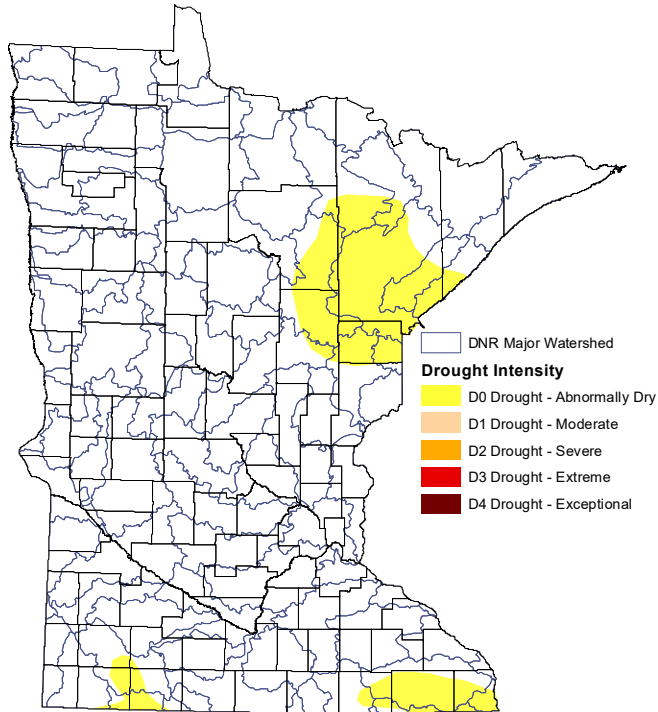
1. Lake Superior - North
2. Lake Superior - South
3. St. Louis River
4. Cloquet River
5. Nemadji River
6. (none)
7. Mississippi River - Headwaters
8. Leech Lake River
9. Mississippi River - Grand Rapids
10. Mississippi River - Brainerd
11. Pine River
12. Crow Wing River
13. Redeye River
14. Long Prairie 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 Wapsipinnicon 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)

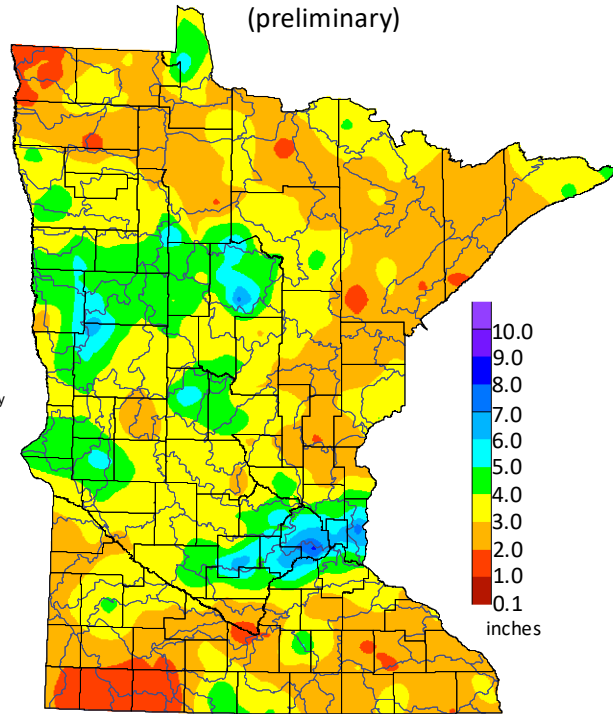
- |  |                                 |  |                                |
|--|---------------------------------|--|--------------------------------|
|  | Cedar River                     |  | Missouri - Big Sioux Rivers    |
|  | Des Moines River                |  | Missouri - Little Sioux Rivers |
|  | 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

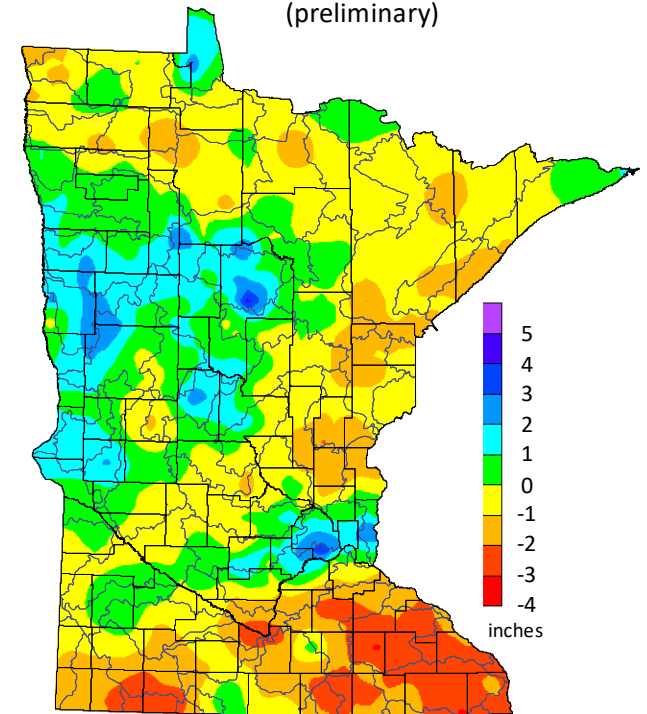
U.S. Drought Monitor  
September 5, 2019



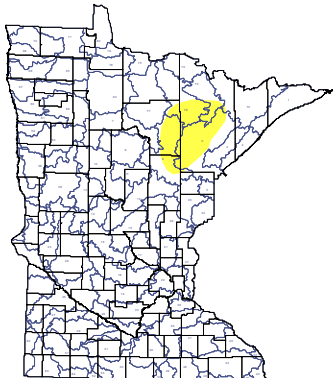
Total Precipitation  
August 2019  
(preliminary)



Total Precipitation  
Departure from Normal:  
August 2019  
(preliminary)



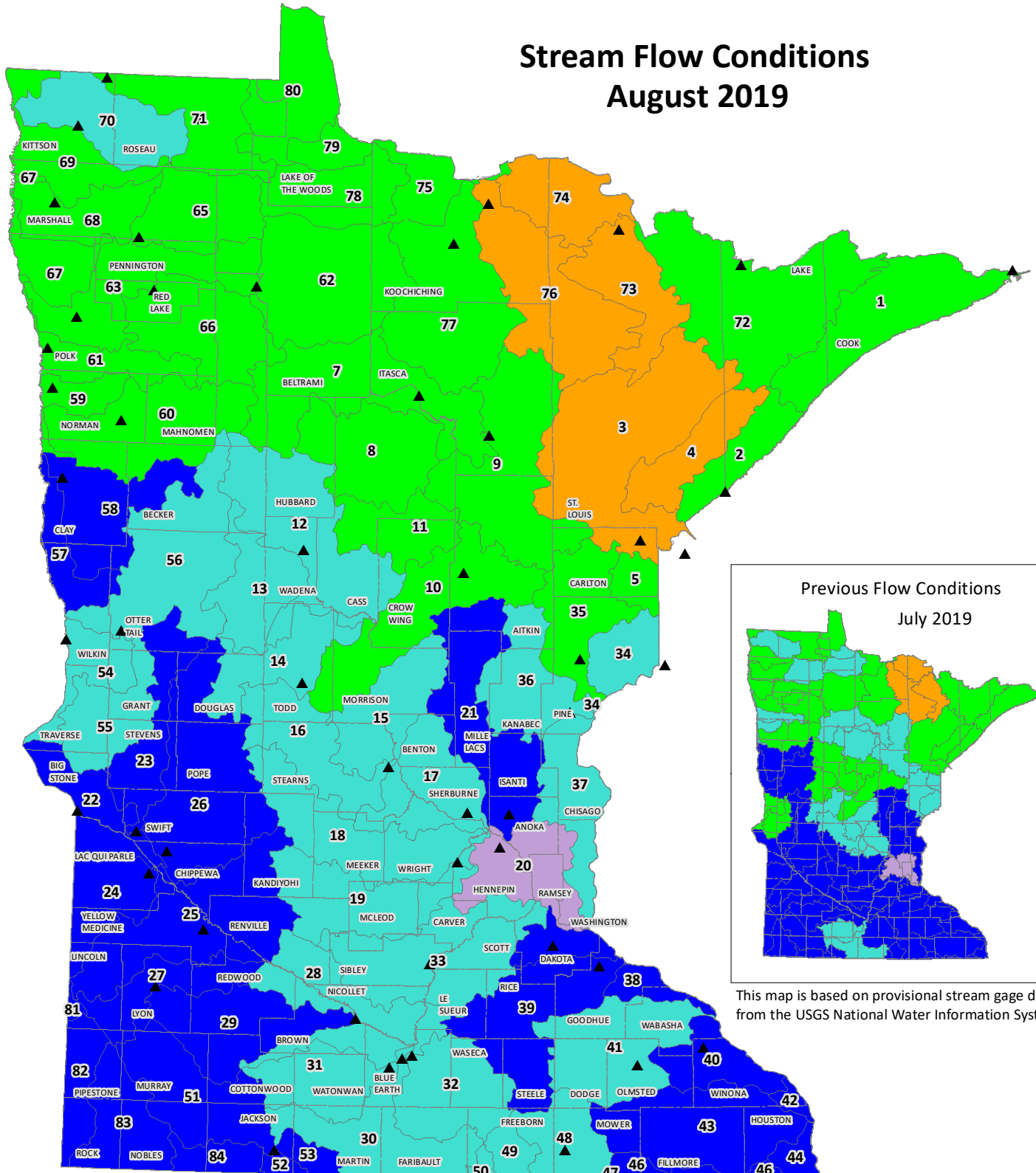
July 30, 2019



Precipitation was highly variable across the state in August 2019, depending upon where the thunderstorms fell. There were pockets that had above normal precipitation. Cass Lake in north central Minnesota recorded 4.99 inches of precipitation, which is 2.02 inches above normal. The town of Morris in west central Minnesota recorded 5.53 inches, which is 2.20 inches above normal. One of the wettest locations in the state was Stillwater in east central Minnesota that had 7.96 inches or 3.15 inches above normal. On the other end of the spectrum was the station 7 miles northwest of Two Harbors that finished with 1.99 inches of precipitation that is 1.75 inches short of normal. Rochester also recorded 1.54 inches for August 2019, which is 2.98 inches below normal. Rochester has been very wet this year and August was the first month since March that was below normal. The preliminary statewide average was 3.25 inches or 0.67 inches below normal. The U. S. Drought Monitor map released on September 5 depicts 9.8 percent of the state in the Abnormally Dry category, confined to northwest Minnesota. One year ago, 27 percent of the state had Abnormally Dry conditions and 7 percent of the state was categorized to be in Moderate Drought. 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 2019



▲ 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.

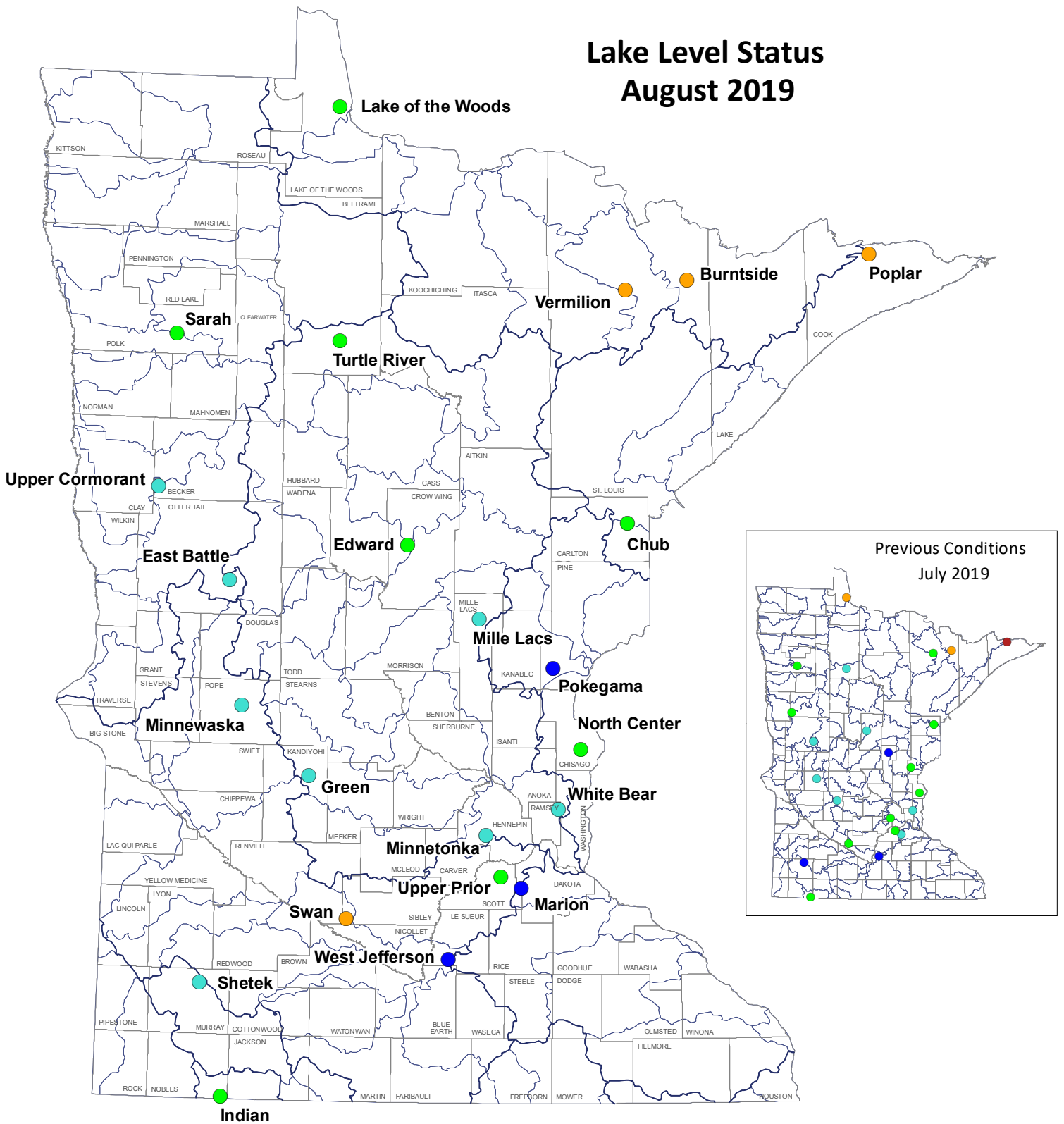
A ranking at the 50th percentile (median) specifies that the present-month flow is in the middle of the historical distribution.

- 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

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

# Surface Water: Lake Levels

## Lake Level Status August 2019



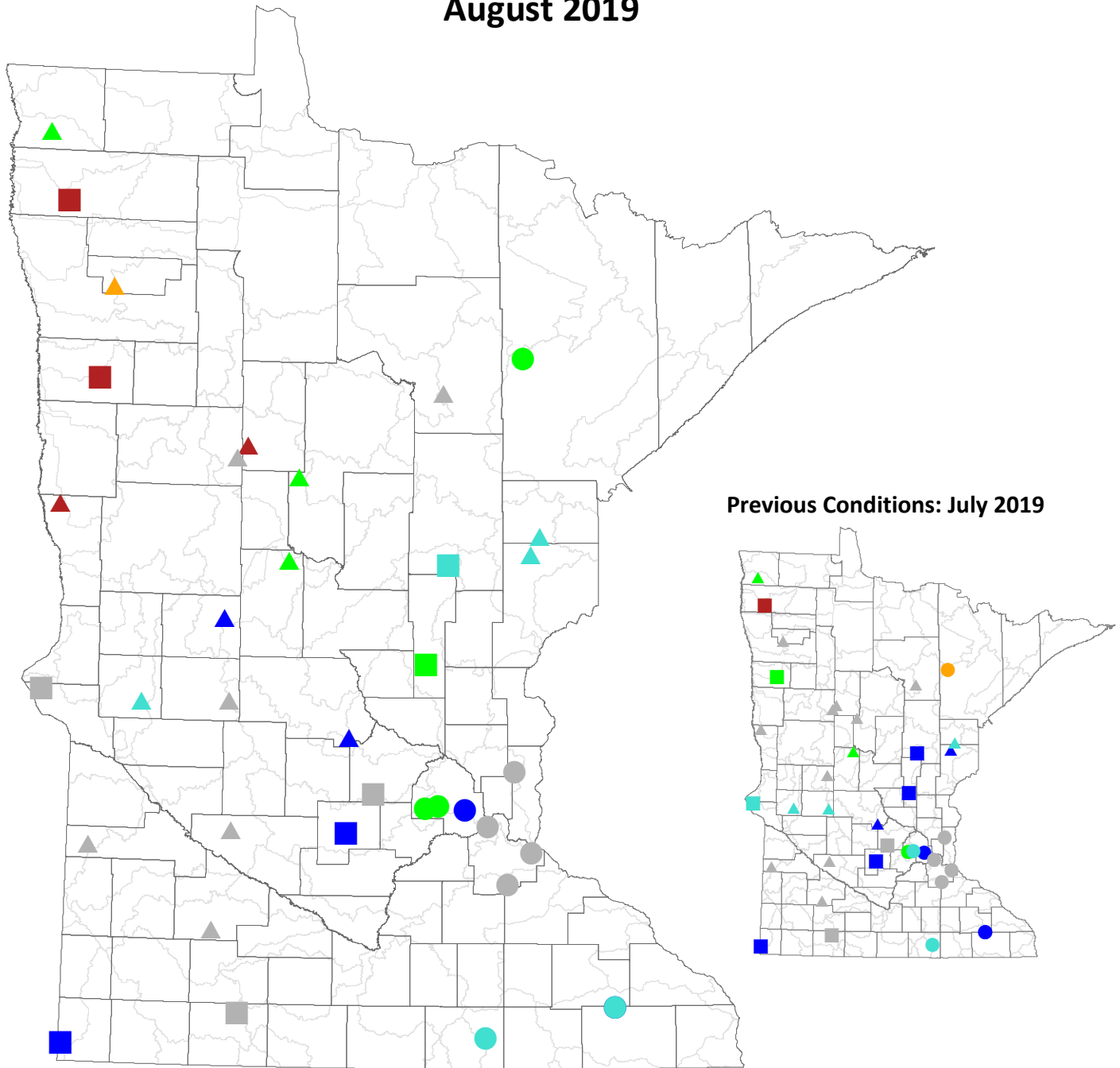
### Percentile \*

- 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.

Source data from: MN DNR Waters Lake Level Minnesota Monitoring Program

## Groundwater Level Historical Rankings August 2019



\* 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