

DNR Climatologist Report - Lake Shamineau's Continuing High-Water

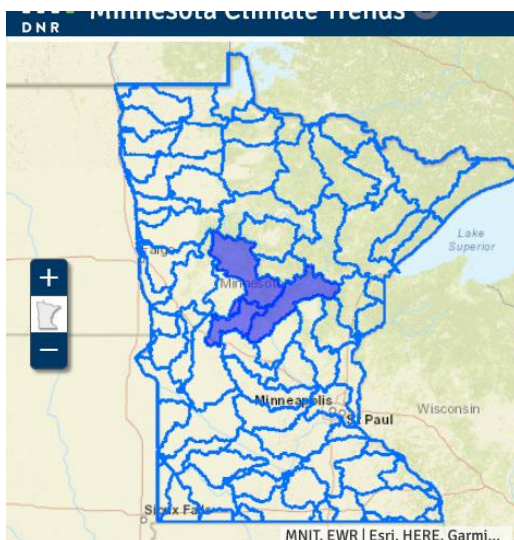
Lake Shamineau area getting wetter, on average

Combining the three watersheds around Lake Shamineau (Crow Wing R, Long Prairie R, and Mississippi R – Brainerd), average annual precipitation increased by approximately 3.8 inches between 1895 and 2022. The early 2020s have been very dry, with episodic and occasionally significant drought, but annual precipitation has been higher during this period than during many other historical dry periods. Thus, even though these recent dry years mark a significant departure from the record-wet 2010s, the relatively high precipitation during this period may further illustrate the trend towards greater wetness in general.

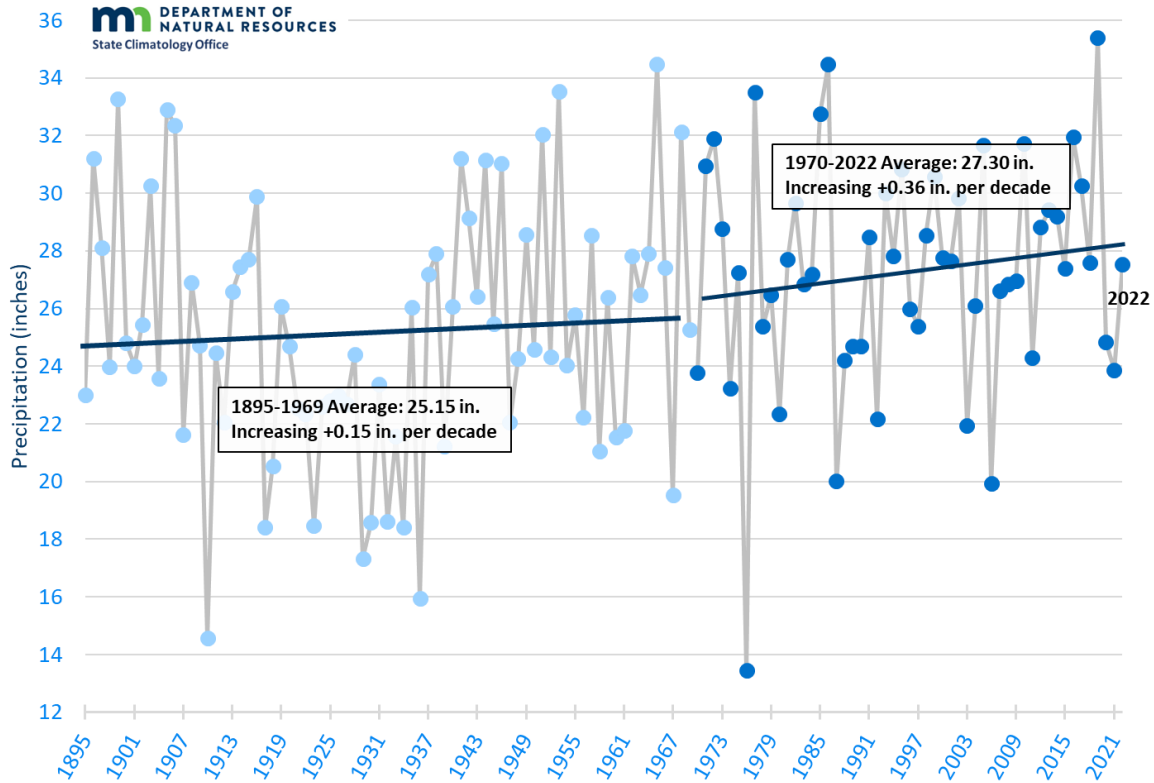
Note, for instance, in the graph below (second image), that the downward spike in precipitation shown in 2020 and 2021 is positioned higher on the graph than virtually all of the other downward spikes (dry years and dry periods) experienced in the area since 1895. [Also, I'm not sure if the circled spikes will translate well in email, so please let me know if you cannot see them.]

There is no doubt that it's been quite dry this decade so far, but in the context of our climatic history for the last 128 years, this would appear to be a remarkably "wet" dry period. The behavior of our dry years is aligned quite well with the overall trend towards increased annual precipitation.

The data in the graph below were obtained from the Minnesota Climate Trends Tool (<https://arcgis.dnr.state.mn.us/ewr/climatetrends/>) by selecting the three surrounding HUC-8 watersheds (per the image below), and obtaining the average annual precipitation for the period 1895 through 2022.



Annual Precipitation, Shamineau Lake Area 1895-2022



More damaging rain and snow

Despite the dry conditions of the early 2020s, heavy precipitation continues to show long-term increases in frequency and intensity over Minnesota and the Mississippi River – St. Cloud Watershed. Stations with at least 100 years of record have seen 15-20% increases in the frequencies of 1-inch rains, 55-65% increases in the frequencies of 3-inch rains, and a 10-15% increase in the size of the heaviest rainfall of the year. Since 2000, Minnesota has seen a significant uptick in devastating, large-area extreme rainstorms as well, with one occurring during the otherwise-dry 2020. Heavy snows have continued increasing in frequency and intensity as well, and the pairing of this trend with warm winter conditions produced a record snowfall season at St. Cloud and some of the most damaging snows on record in Minnesota during the 2022-23 winter. Climate projections indicate the big rains will continue increasing into the future, and heavy snow events may increase too, even if seasonal snowfall decreases in the decades ahead.

Cold weather warming

Much of the region's observed warming has been when it's coolest. Since 1970, winter has warmed 3-4 times faster than summer, and nights have warmed almost twice as fast as days. The frequencies of -20, -25, -30, and -35F readings in the St. Cloud area have fallen by up to 90%. Minnesota does not get as cold as it once did, and even though the state always will see periodic severe cold spells, the long-term decline in cold extremes is all but guaranteed to continue.

Prepared by the Climatology Office of the Minnesota Department of Natural Resources