

Update on Chandos Lake water levels during the summer of 2019

Below is a chart comparing water levels in 2018 and 2019 from May to November.

Readings are from the South Bay Stick Gauge, and are from within a couple of days of the first of each month. So they are **not** monthly averages, just spot raw data. (*Data is only collected sporadically when the observer happens to be at Chandos*)

The results are given in inches above a datum of 1025 feet.

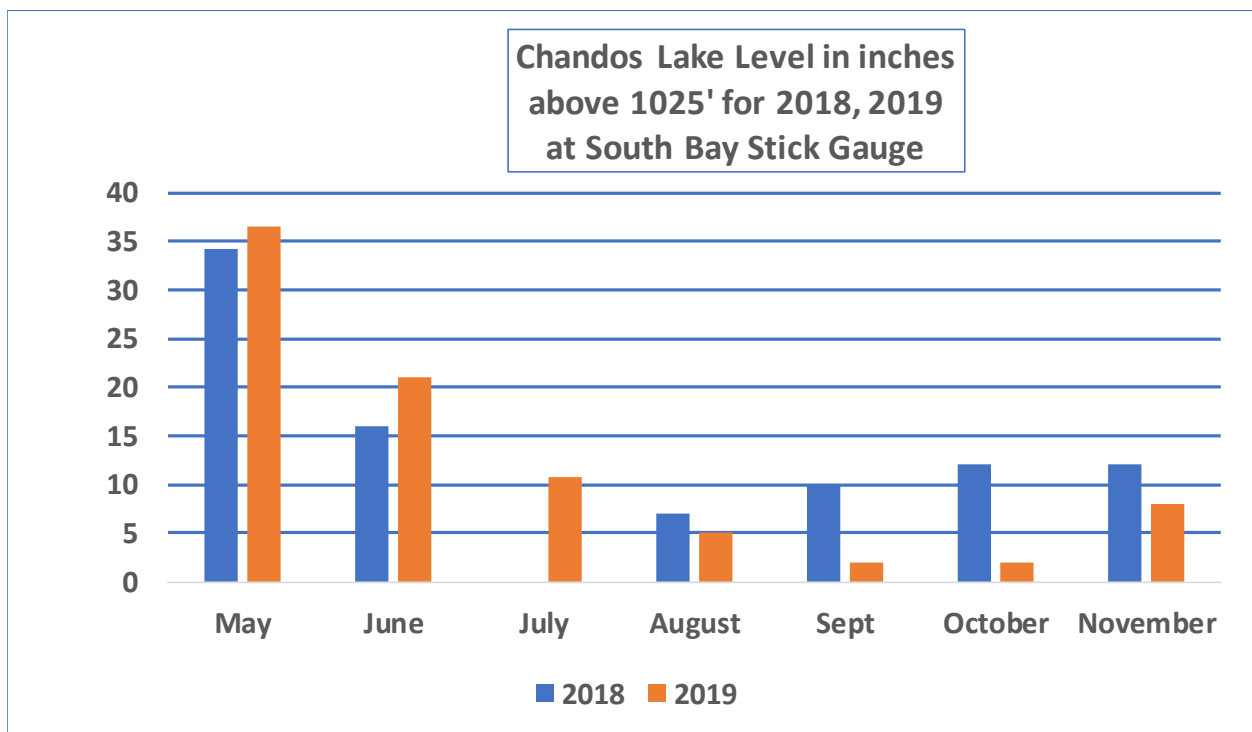


Fig 1. Spot Data from the first day of the months May-Nov, 2018 and 2019

Notes

- i) I do not have a data point for July 1, 2018, and so have left it blank.
- ii) Late summer waters in 2019 are quite low when compared to 2018, with September/October waters being 8-10" lower. This is attributed to a known decrease of precipitation in 2019 and perhaps a higher than usual evaporation.

iii) Based on measurements at Trent U Climate Station, during July and August of 2019, there was 1.56 inches less rain than in 2018. The recent rise in lake levels may well be due to the high October 2019 precipitation level which is about 100 mm more than that received in September 2019.

Precipitation as measured at Trent U for 2018, 2019, (which of course could be different than at Apsley) is:

	2018	2019	diff mm	diff inches
june	68.5	79.9	11.4	0.45
july	59.6	54.9	-4.7	-0.19
aug	106.4	71.4	-35	-1.38
sept	32.4	41	8.6	0.34
oct	84.8	142	57.2	2.25
nov	102.9	47.3	-55.6	-2.19
total	454.6	436.5	-18.1	-0.71

See the Environment Canada site for the source of the above data at:

https://climate.weather.gc.ca/climate_data/daily_data_e.html?hlyRange=2005-05-12%7C2019-12-01&dlyRange=2005-05-17%7C2019-12-01&mlyRange=2006-04-01%7C2006-12-01&StationID=43763&Prov=ON&urlExtension=_e.html&searchType=stnName&optLimit=specDate&StartYear=2017&EndYear=2019&selRowPerPage=25&Line=1&searchMethod=contains&Month=7&Day=1&txtStationName=peterborough&timeframe=2&Year=2018

iv) The effect of rainfall on the lake level is not straightforward. The Chandos Lake watershed, which drains into the lake, is at least 5 times larger than the lake itself. If the land is dry, not much of this watershed rain will make it to the lake. However, if it is not too arid, then some of it will. So, an extra 1" of precipitation can have an outsized effect on the lake level, and under normal conditions could be (my guess) as much as 3". We had a reasonably dry summer, so the contribution from the watershed would not have been that great.

v) A low lake level in the fall will help keep peak levels lower in the following spring, but it is not on a 1:1 basis. This is because of the reverse flow phenomenon we experience on Flat Creek due to higher levels on the Crowe

River. If Chandos starts low, it will take longer for the lake and the Crowe to reach the point where the creek reverses again and water flows out of the lake.

Because of the higher gradient existing with a low lake level, the inflow will start at a much higher rate, and will go on for a longer time. This extra time also allows more runoff to accumulate before the outflow establishes itself. The lake will continue to rise until not only flat creek turns to outflow, but also until the outflow becomes higher than the inflow to Chandos from runoff, precipitation, and ground water. Some recent modelling has indicated that the ratio could be as high as 5:1. ie, a 25" difference in fall lake levels might only make a 5" difference to peak spring waters. If the lake starts high, then the duration of the Flat Creek reversal(inflow) is shortened. Consequently, not as much water will flow in, and the spring runoff will begin to discharge much sooner.

vi) Please see the water level report at Chandossier.com for further info.

<https://chandossier.files.wordpress.com/2019/07/chandos-lake-water-level-investigation-report-clpoa-june-2019-rev2-1.pdf>