

2020 SECCHI DIP-IN



Photo Credit: Marge Sidney

BC Lake Stewardship Society

Background

The Secchi Dip-In is a program of the North American Lake Management Society (NALMS). The mission of the Society is to forge partnerships among citizens, scientists, and professionals to foster the management and protection of lakes and reservoirs for today and tomorrow (NALMS, 2020). The Secchi Dip-In began in 1994 to demonstrate that volunteers can provide accurate, consistent information for lakes. As of the latest Dip-In annual report (2016), more than 46,500 records on more than 7,800 waterbodies have been submitted from twelve countries (Snyder, 2017). Data was submitted for lakes in eight countries (Canada, Denmark, Ireland, Italy, Serbia, Sweden, Turkey, and the United States) during 2016, including lakes in thirty (31) U.S. states and three (3) Canadian provinces (Snyder, 2017).

The Secchi Dip-In program is an ongoing effort to have volunteers gather water quality data on an annual basis, particularly in July. Secchi Dip-In participants include trained monitoring volunteers, individuals interested in volunteer-based science efforts, and lake enthusiasts (Snyder, 2017).

The History of the Secchi Disk

Pietro Angelo Secchi, an astrophysicist and scientific advisor to the Pope, created the Secchi disk in 1865, when he was asked to measure the clearness of the water in the Mediterranean Sea. Secchi created a white disk attached to a line, which he lowered into the water and recorded its depth. He continued “dipping” from season to season and year to year and compared his readings over time. Since then, various sizes of disks have been used, with the most common being an 8-inch diameter plastic disk with black and white quadrants.



How is the Secchi Disk Used?

The process is simple: using the attached line or tape measure, lower the Secchi disk into the water until it is just out of sight. Record this depth using the increments on the line or tape measure. Now, raise the disk slightly until you can just see it and record this depth. The average of the two depths is your Secchi disk reading.

British Columbia's Dip-In Participation

Since 2002, the BC Lake Stewardship Society has coordinated BC's participation in the North America-wide annual Secchi Dip-In. This year (2020), 62 dips were done on 34 lakes which is an increase of 12 dips and an increase in 1 lake from 2019. We had several volunteers that submitted multiple dips for their lake and the average was taken of those measurements. Two dips were outside of the timeframe of the Dip-In, which takes place in the month of July. Overall, since 2010, there has been a 33% decrease in the number of lakes with Secchi depth readings collected during the BC Secchi Dip-In. The BCLSS would like to increase the number of Dip-In readings because these annual snapshots can be put together to form a changing picture of transparency over time (NALMS, 2020).

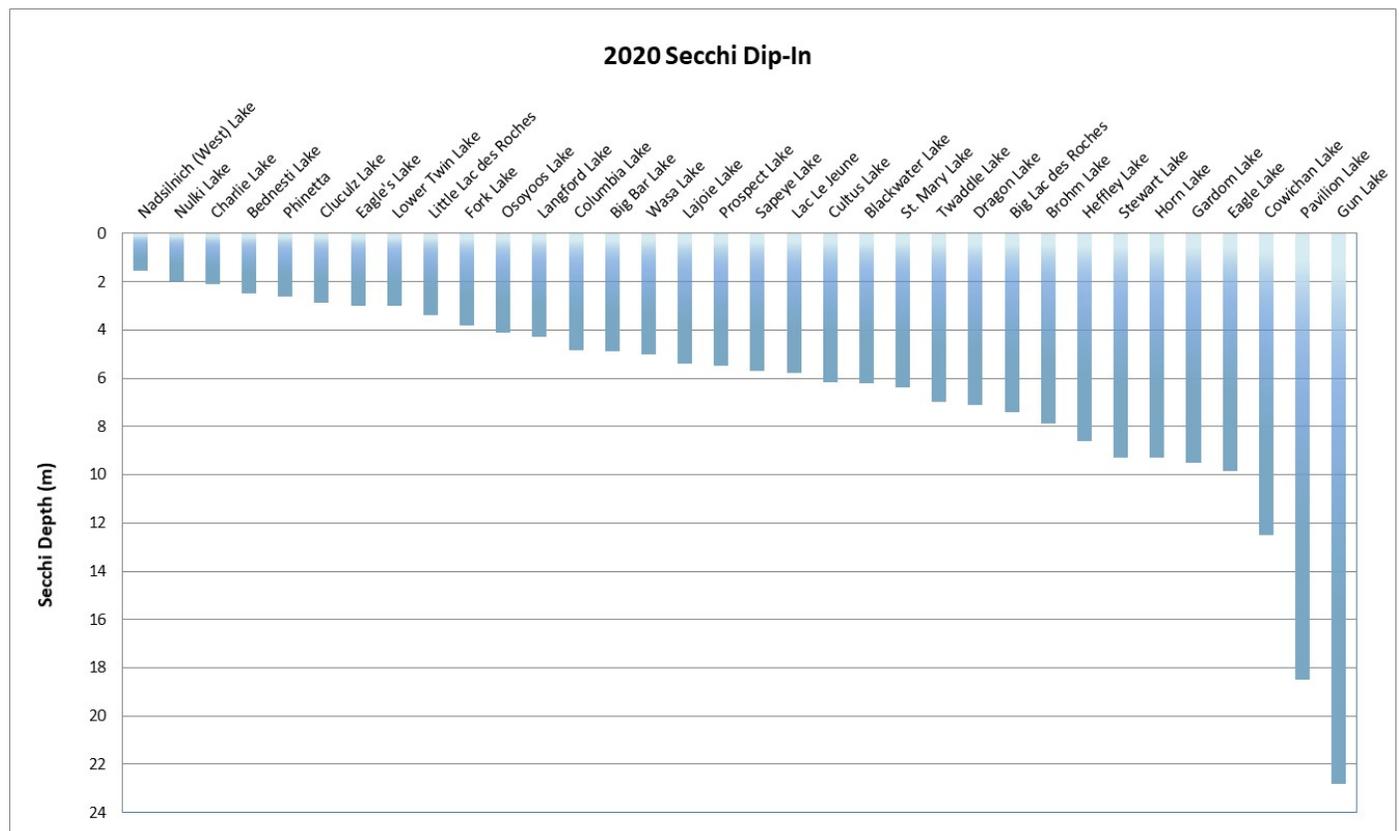
Temperature and pH

This year, temperature readings were included with 93% of Secchi depth readings. We also received pH readings for 8 lakes.

The coldest reading was from Stewart Lake (Vancouver Island) at 13.8°C and the warmest reading was 24°C at Fork Lake (Vancouver Island).

Secchi Readings

The deepest Secchi reading was recorded at Gun Lake (Thompson-Nicola region) at 22.8 m. The second deepest Secchi depth measured was Pavilion Lake (Thompson-Nicola region) at 18.5 m. The shallowest reading was at Nadsilnich (West) Lake (Omineca/Peace region) at 1.53 m. The second shallowest reading was at Nulki Lake (Omineca/Peace region) at 1.96 m.



What Does the Secchi Disk Tell Us?

The Secchi disk gives us a reading of water transparency according to the depth of the measurement. The volume of suspended particles contained in the lake water affects transparency. These suspended particles can be a combination of things such as zooplankton, algae, pollutants, and silt. Comprehensive Secchi data collected year after year can provide valuable information on trends in transparency for monitored lakes. Every lake is different in size, shape, depth, and geography, and each has its own combination of particles. Each Secchi reading provides a “snapshot” of the water quality in the lake at that particular time.

What Can Cause Changes in the Secchi Reading?

Readings that show a trend of **decreasing** depth for a lake during the Dip-In (in the summer) may be the result of one or more of the following factors:

- i. Environmental variability associated with annual climatic variation
- ii. Higher nutrient levels which can increase algal growth
- iii. Erosion of the shoreline or erosion from site development near the lake
- iv. Recirculation of bottom sediment from motorboat activity
- v. Discolouration of the water from wetland runoff and/or plant decomposition
- vi. Reduced zooplankton populations

Additionally, most lakes will experience increased boat activity on weekends and holidays. Taking a Secchi reading on the day after a weekend or holiday may show different results than a reading taken at a different time of the week. This can reveal the effect increased boat activity has on the transparency of a lake. Significant storm events, storm water runoff, and turnover can also alter Secchi readings.

Readings that show a trend of **increasing** depth can be the result of one or more of the following:

- i. Environmental variability associated with annual climatic variation
- ii. Low nutrient levels, which can decrease algal growth (lower productivity of the lake)
- iii. Little or no mixing of the lake water (sediments settle to the bottom)
- iv. The effects over time of shoreline restoration – clarity may increase if shoreline enhancement projects have been accomplished and consequently erosion and/or pollution sources have decreased
- v. Increased zooplankton populations

Become a Dipper!

Please encourage others to take part in the 2021 Secchi Dip-In. If Secchi depth is measured in a lake routinely for many consecutive years, the data can be analyzed for trends in water clarity. This could be valuable for examining the effects of climate change.

This year, the North American Lake Management Society introduced a new Secchi Dip-In database via the AWQMS public portal. This portal allows you to view publicly available Dip-In data and includes historical information for BC lakes that have participated in the Dip-In. If you would like to explore the data and associated graphs, you can go to <https://www.nalms.org/secchidipin/explore-the-data/>.

To become a dipper for the 2021 Secchi Dip-In, please contact the BCLSS office. An email reminder with instructions and data sheets will be sent out in the spring. A **FREE** Secchi disk is provided to every new member or member group and can also be purchased through our office.

References

North American Lake Management Society (NALMS). 2020. www.nalms.org

Snyder, V. 2017. *2016 SDI Report*. North American Lake Management Society. Accessed October 15, 2018. http://www.secchidipin.org/wordpress/wp-content/uploads/2017/05/v2.0_SD1-2016-Annual-Report-updated-05-30-2017.pdf