

Summary of Columbia Lake Stewardship Society's 2022 Water Quantity Monitoring Program

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Executive Summary

2022 was the eighth year of operation for the C22 Water Quantity Monitoring Program.

The year was marked by an above normal snowpack, a cool spring and a hot dry summer. Together they contributed to a runoff pattern that deviated from those experienced in earlier years, resulting in the lake cresting later and at a higher level.

A long-standing problem in examining the local hydrology is the lack of weather information. The source of such information in the past has been the Cranbrook Airport which is 40 km distant and not representative of local conditions, especially precipitation. Over the past few years weather information has been recorded at locations in the Pavorama area and the records are now of sufficient duration that a picture of the local climate is beginning to emerge, particularly of snow depth. Using that information, the emphasis this year was on examining the snow cover – runoff relationship.

The snowpack depth at the 2250 metre elevation did not begin to decrease until about May 1, about one month later than usual. By that time, the depth of the snowpack was well above the depths of previous years. Further, owing to the cool spring, it was slow to melt and it was late June before the ground was snow free. Less snow melted at lower levels and melted earlier but did not trigger a significant response in Dutch Creek. The greatest response occurred when the high level melt began in earnest, suggesting that most of the runoff that feeds lake rise originates from snow cover at elevations of 2250 metres and higher.

Usually, Dutch Creek overflows its banks during the spring runoff with some of the overflow entering the lake causing it to rise. One of the consequences of the unusually large volume of runoff this year was an overflow so large it covered the Dutch Creek delta to the extent that it became an extension of the lake. Such circumstances complicate water balance calculations because seepage and surface water volumes cannot be calculated from the available information. Either the volume of water passing beneath the Dutch Creek bridge or a lake surface area – elevation relationship, and preferably both, are required.

Not all the hydrological issues were confined to the runoff period. A cold weather spell during December created an ice jam that blocked the Columbia River, backing water up into the lake and causing it to rise by 20 cm or more.

Due to the effort expended in examining the newfound snow data little progress was made on computing evaporation/precipitation losses and groundwater gains in the lake that was underway in previous years.