

## **Background**

Water in Otter Lake is supplied from an extensive drainage area (10,000 acres or more) via at least 9 small streams, most of which feed into the lake via its numerous wetland areas. Because Otter Lake abuts the Smiths Falls and area limestone plain there are also several natural springs, the location of which and the volume of water they produce are unknown. However, Otter Lake has only a single outlet, Otter Creek. Since the 1960's beavers have been quite active in the upper reaches of the creek. RVCA estimates that there are at least 8 beaver dams between Otter Lake and Lombardy. All of these dams reduce the flow of water in Otter Creek, however only 2 or 3 dams downstream from the culvert on Otter Lake Road have significant effect on water levels in Otter Lake. As a result, beaver activity in the creek combined with the large volume of water resulting from the early spring runoff can often have a significant effect on the water level in the lake. Water levels are often quite high in the early spring, especially if there has been a rapid spring thaw. Climate change is also a factor. These high water levels can, on occasion, cause local flooding, particularly in the wetland areas that surround the lake. Private access roads and low-lying properties may be affected if adequate preventative measures have not been taken by the owners. Protecting our wetlands, one role of the Rideau Valley Conservation Authority (RVCA), is important. However, the RVCA has expressed its willingness to work with residents to develop strategies to alleviate some of these issues. After the spring runoff is complete the lake level usually drops significantly over the course of a normal summer, with most of the water loss resulting from evaporation and lack of inflow. In fact, severe hot, dry summers can lower lake levels sufficiently to expose rocks and shoals in the lake that are not normally a concern to boaters. Water levels can again rise in the fall, when beavers again become active in the creek, however following the freeze over, the lake level will drop during the winter months.

## **Control of Water Levels**

In 2000, an attempt was made to control the water flow in the creek by the installation of "beaver bafflers" in the beaver dams in the upper reaches of Otter Creek. A "beaver baffler" is essentially a tube inserted through the base of the beaver dam. OLLA supported, and participated in beaver baffler installation, however, the bafflers were not successful, primarily because they required continual maintenance.

In 2007 RVCA implemented (on a trial basis) a Beaver Management Program. In June of 2007 and in response to concerns/complaints received from property owners regarding flooding of property and access roads, RVCA proposed the following action.

"In an effort to balance the aquatic ecosystem needs and landowner

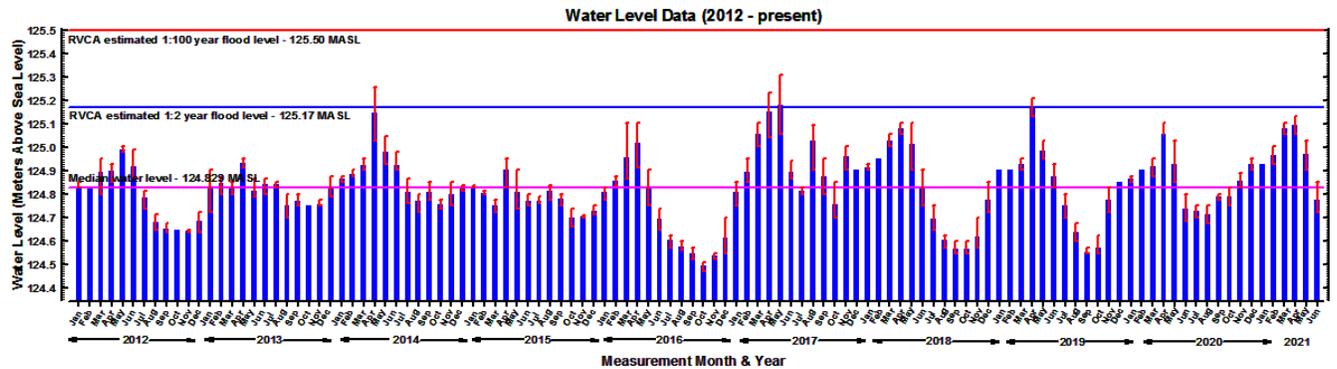
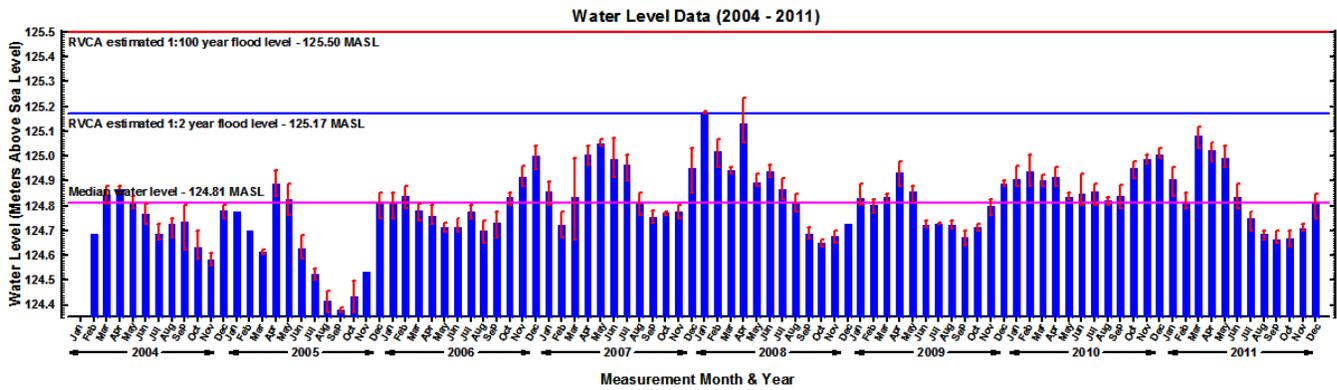
flooding issues it is recommended that Dam #1 and #2 in the upper reaches of Otter Creek be breached in the center of the dam. The following mitigation measures will be implemented during beaver dam removal activities. Breaching of the beaver dam will be carried out in a manner that minimizes downstream sediment load. Breaching of the beaver dam will occur during low flow conditions and on days when rain is not expected. Only a small portion of the dam will be pulled back at one time to allow the water from the beaver pond to be released slowly. As water levels decrease, the size of the opening may be increased to allow complete drainage of the retention area. Work is to be completed by hand with NO heavy equipment on the bed of Otter Creek at any time. Areas downstream of the beaver dam will be monitored during breaching activities to determine whether damage to the channel and adjacent properties receiving additional water volumes are occurring. Fish that become trapped in isolated pools as a result of beaver pond de-watering will be relocated to the main channel of the watercourse. Dam building nuisance beaver for Dam #1 and #2 will be trapped using appropriate trapping methods”.

All property owners should be aware that all the above actions to lower lake levels were an RVCA initiative in collaboration with the Otter Creek Beaver Management Group (OCBMG). OLLA did not make any requests to RVCA regarding water levels and chose not to support the OCBMG. OLLA maintained an informational and consultative relationship with RVCA throughout the period these activities were taking place. The RVCA program ended in 2010, however, RVCA continued its beaver management activities until 2017 at the request of, and with the financing of, the OCBMG.

OLLA’s current and ongoing mandate is to measure, record and communicate water levels to the Rideau Valley Conservation Authority (RVCA). OLLA does not undertake any effort, either alone or in concert with any other party, to control or manipulate the water level on Otter Lake.

### **Water Level Monitoring**

OLLA has accurately measured water levels since 2003. The water level is measured several times a month at a site on Toohey Bay that has been calibrated by RVCA at 124.91 metres above sea level (MASL), or during the winter months at the culvert on Otter Lake Road that has also been calibrated by RVCA. The graphs on the following page show the water level in Otter Lake from February 2004 to the present. The “error bars” in red indicate maximum and minimum water levels for the month. The green reference line represents the median water level of 124.81 MASL and the upper reference lines represent RVCA’s estimated 1:2 and 1:100 year flood level respectively. The graphs clearly indicate how water levels can fluctuate quite dramatically with the seasons.

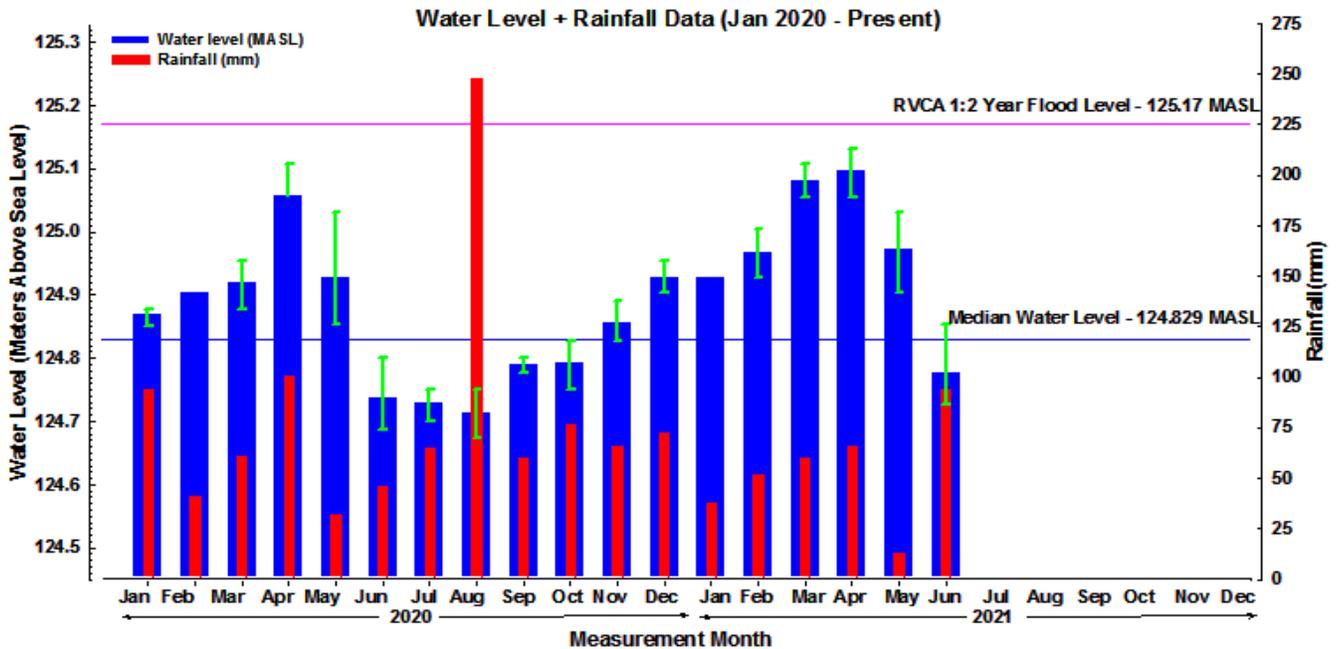


The lowest water level ever recorded was in 2005. In that year water levels were moderately high following the spring freshet, however the lake level dropped almost half a meter between April and September. The summer of 2005 was incredibly hot and dry with virtually no rain in June, July and August. In addition, beaver dams in the upper reaches of the creek were destroyed and beavers were removed from the creek (by person(s) unknown). Hence, there was increased outflow of water from the lake that could not be replenished and there was extensive water loss by evaporation. It should be noted that this activity in Otter Creek was NOT initiated NOR supported by OLLA, however since the Association does not have policing powers, there is little that can be done if individuals, whether they be Otter Lake property owners or from elsewhere, choose to take it upon themselves to trespass on private property for the purpose of removing dams and/or beavers.

High water levels were experienced in the early spring of 2008 following a winter of excessive snowfall. In April 2008 water levels exceeded RVCA's 1:2 year flood level which would have resulted in some flooding of low lying areas. Water levels were again high in the spring of 2014 and exceeded RVCA's 1:2 year flood level in April. The highest water levels ever recorded were in April and May of 2017, a year in which we had a very wet spring and summer as opposed to 2016 which was hot and dry.

## Current Water Levels

The graph below shows the lake level from January 2020 to the present. Again the “error bars” represent maximum and minimum water levels for each measurement period. The yellow reference line on the graph indicates the median water level of 124.827 MASL and the green reference line represents RVCA’s 1:2 year flood level.



The graph also includes rainfall amounts since the latter has a very significant effect on water levels. The lake level rose slightly throughout the winter months and our spring “high” was reached in mid April and may have resulted in some minor flooding of low lying properties and some access roads. There was little significant rainfall in May, June and July, hence the gradual drop in water levels since daytime temperatures were quite high. However the record high rainfall in August put an end to the drop in water levels and water levels began to rise throughout the remainder of the summer and fall. The last time we had that high an amount of rainfall in a single month was in May 2017.

The winter of 2020 – 2021 was average with respect to snow storms and our spring freshet was quite gradual through out March and early April and would not have resulted in much serious flooding. The lake was completely frozen over just after Christmas Day and the ice was off the lake by the end of March.