

STORM WATER DRAINAGE SYSTEM AND THE HEALTH OF OUR LAKES
MARCH 16, 2022

One of the concerns raised in the Draft Watershed Management Plan I submitted to the Village BOT a year ago was the thickening anoxic water in Tuxedo Lake. This anoxia (very low levels of dissolved oxygen [DO]) develops in the late spring and thickens during the summer months (Fig. 1). It is caused by excessive organic matter production, engendered primarily by phosphorous loading from the watershed and lake sediments. No animal life can survive within this layer. In the late fall, cooled surface waters sink bringing oxygen to the deeper waters and the anoxia disappears.

In the fall of 2008 anoxia developed below 12 meters in Tuxedo Lake. By October of 2020, the top of the layer was between 8 and 9 meters. Our lake manager reports that the top of this layer in the Fall of 2021 is little changed from 2020.

Our drinking water intake pipe, (depth 7 to 7.7 meters), is now less than two meters above the top of the Fall anoxic layer. Trout, to thrive need temperatures below 20 degrees C and DO > 5mg/L; in 2008 this zone of appropriate trout habitat was 2 meters thick by September 2019, it had shrunk to between 1.3 and 1.5 meters.

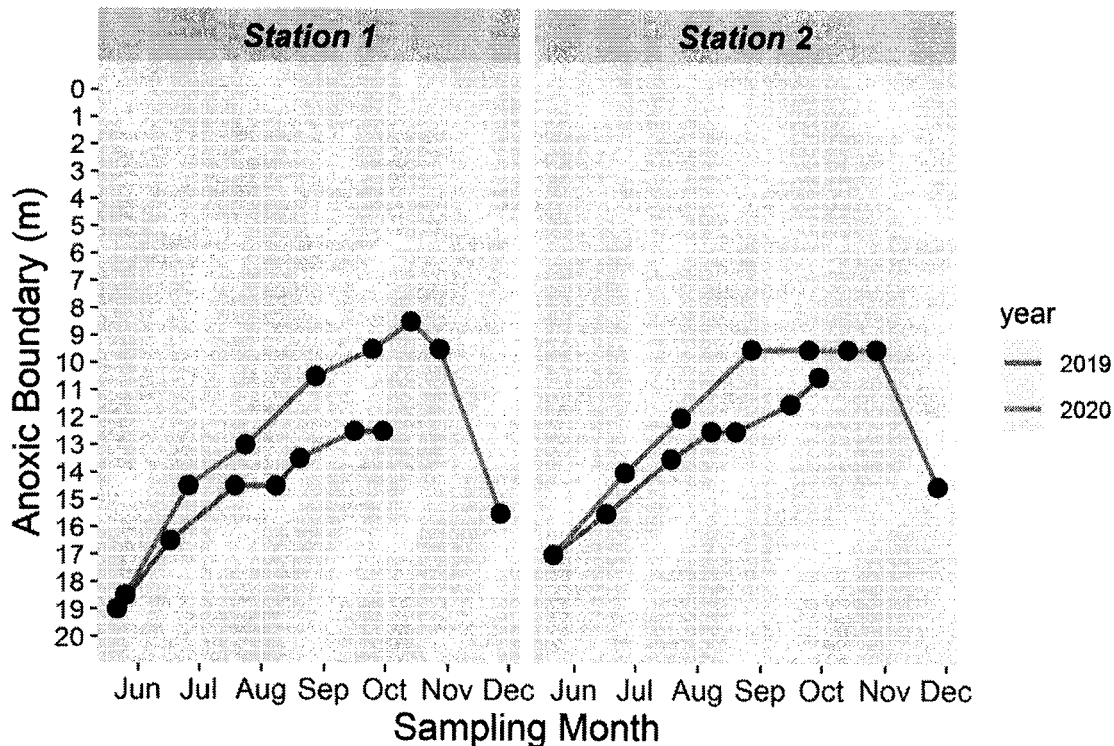


Figure 1 Depth to the top of the anoxic layer during the summer seasons of 2019 and 2020 at two stations in Tuxedo lake.(Prepared by A. J. Reyes).

If this anoxic layer continues to thicken it could threaten our drinking water, necessitating raising the intake pipe. In addition, the shallowing nutrient rich waters of this layer can mix into the surface waters, during summer wind events, fueling increased algal growth. The long term cure is to reduce the phosphate input from the watershed by vegetating the margins of the lake, reducing the input of nutrients through storm water drains and sealing lake sediments. We are working on the first of these and a separate proposal will be submitted to the BOT.

As to the storm water system we do not have accurate information about the connections between catch basins and the piping that conducts water to our lakes. Last year Weston and Sampson provided a proposal to map the storm water pipe network (About \$20K attached). The BOT did not fund this.

We again propose that the Village fund the mapping of our storm water piping system. It is my understanding that we have accurate information about the positions of our sewer pipes and drinking water pipes but we don't have comparable information about our storm water system. It is important to know where the pipes are that carry storm water to our lakes and the catch basins to which they are connected, in order to locate sources of pollutants that reach our lakes through this system.

Respectfully submitted:

James Hays
Chair of Tuxedo Park Lakes Committee