

WATER QUALITY MONITORING – LAKE HUGHES DISSOLVED OXYGEN TESTING – SUMMARY 2023

Testing done by CRE Laurentides

LAKE HUGHES

The maximum depth of Lake Hughes is 26,8 meters (88 feet).

Between 2011 and 2023 at about the same period of the year, the water temperature was:

> 21-23°C (surface) which requires oxygen levels 63%.

> 4-5°C (bottom) which requires oxygen levels 54% (in order not to have a deficit).

DISSOLVED OXYGEN TESTING - SUMMARY

OXYGEN IS TESTED AT EVERY METER AT THE DEEDEST SPOT IN THE LAKE.

2011

2011-07-07: **No oxygen deficit**

Bottom of lake oxygen 62.4%

2021

2021-07-22: **Oxygen deficit starting at 23 m**

Bottom of lake oxygen 38,1%

Slight oxygen deficit in the last meters

2022

2022-06-09: **Oxygen deficit starting at 19 m**

Bottom of lake oxygen 39,1%

2022-08-02: **Oxygen deficit starting at 11 m**

Bottom of lake oxygen 4,5%

2022-09-14: **Oxygen deficit starting at 5 m**

Bottom of lake oxygen -0,4%

PRONOUNCED LACK OF OXYGEN (ANOXIA)

2023

2023-08-30: **Oxygen deficit starting at 16 meters**

Bottom of lake oxygen 24,0%

STILL A DEFICIT BUT IMPROVED OXYGEN LEVELS SINCE LAST YEAR

IN ORDER NOT TO HAVE A DEFICIT, OXYGEN LEVELS SHOULD BE 54% AT THE BOTTOM OF THE LAKE.

COMMENTS BY DR CARIGNAN (CRE Laurentides)

It should be noted that Lake Hughes has negative heterograde oxygen profiles in the metalimnion. Such profiles can be observed in lakes with low transparency and high human occupation in the watershed. The deterioration observed in 2022 could be explained by the breaking of a beaver dam, an event that occurs during high floods and generates a significant input of organic matter.

**RECOMMENDATION: INSPECT STREAMS FOR BEAVER ACTIVITY /
TEST STREAMS FOR PHOSPHORUS**

The cost of Dissolved Oxygen testing is about \$500 per test.

The above 6 tests have all been done free of charge by the CRE Laurentides for Lake Hughes.

ASSESSMENT OF DISSOLVED OXYGEN TESTING 2022 AT LAKE HUGHES BY DANY BOUDRIAS, A BIOLOGIST WHO HAS EXPERIENCE IN LAKE MANAGEMENT

WHAT CAN CAUSE THIS TYPE OF OXYGEN DEPLETION:

Respiration of algae during night, consumption of oxygen by massive population of zooplankton, decomposition by bacteria of suspended sediments/dead organic material from stream inputs, beaver dam that broke recently, construction and sediment transport from a project, septic leaching...Could be a combination of factors.

RECOMMENDATION: GOOD & WELL PLANNED LAKE STUDY