

LAKE ROWLAND WATER QUALITY UPDATE

LAKE DESCRIPTION

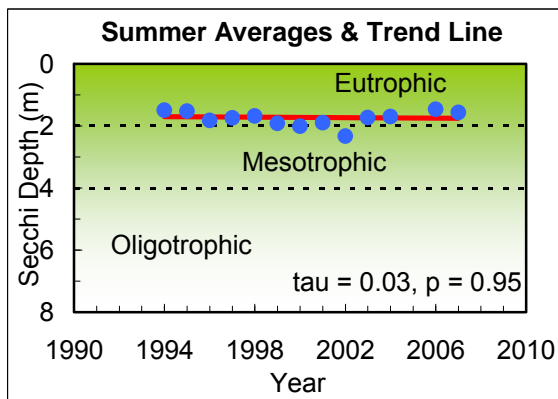
Lake Rowland is a 20-acre lake located one mile west of Lake Goodwin, adjacent to the Kayak Point Golf Course. The lake has a maximum depth of 8.0 meters, but much of the lake is quite shallow. Only a portion of the lake has open water year-round. There are no perennial streams entering the lake, so groundwater is likely the main water source. The watershed draining into the lake is large and sparsely developed, except for the golf course.

LAKE CONDITIONS

The following graphs illustrate the summer averages and trend lines (in red) for water clarity and total phosphorus for Lake Rowland. Please refer to the table on the third page for long-term averages and for averages and ranges for individual years.

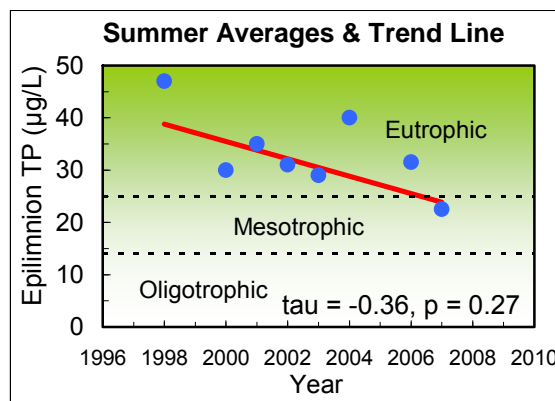
Water Clarity

Water clarity in Lake Rowland is low, with a long-term average of 1.8 meters. The dark color of the water (from natural humic compounds from surrounding wetlands) is partly responsible for the limited clarity. Water clarity averages appeared to be improving from 1994 through 2002, but in 2003 to 2007, water clarity declined slightly. There is no evidence of a statistically significant trend in water clarity. Instead, water clarity values seem to be fluctuating within the natural range of conditions.

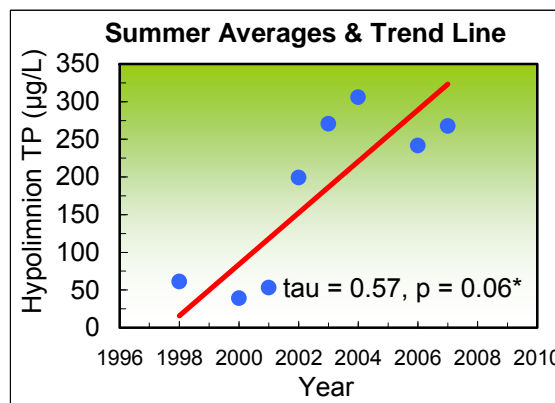


Total Phosphorus (key nutrient for algae)

Total phosphorus concentrations in the epilimnion (upper waters) are high and quite variable. The long-term 1998-2007 summer average is 33 µg/l. There is no evidence of any significant trend in epilimnetic phosphorus values, although the 2007 average was lower than in past years.



Summertime phosphorus averages in the hypolimnion (bottom waters) are also high and appear to be increasing. The average from 1998 – 2007 is 180 µg/l. Beginning in 2002, phosphorus levels have been much higher than in previous years. This has resulted in a statistically significant trend toward increasing phosphorus levels in the hypolimnion. Higher phosphorus levels in the hypolimnion indicate the release of nutrients from bottom sediments during periods of low dissolved oxygen and may be a sign of accelerated eutrophication in the lake.



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Chlorophyll a (Algae)

No chlorophyll a data are available for Lake Rowland, so the levels of algae are unknown. However, occasional algal blooms have been observed in the lake, and there are enough nutrients to support nuisance algae growth.

SUMMARY

Trophic State

Based on low water clarity and high phosphorus concentrations, Lake Rowland may be classified as eutrophic. The lake also supports dense growths of aquatic plants that limit the open water area during the summer season.

Condition and Trends

One of the water quality targets for Lake Rowland set forth in the 2003 State of the Lakes Report was to maintain or improve water clarity. The lake is meeting this target because water clarity has been stable through the years.

Another target for Lake Rowland was to reduce total phosphorus concentrations. Instead, it appears that phosphorus levels in the bottom waters are increasing.

Lake Rowland is in satisfactory condition for a shallow lake. However, the lake is at risk of declining water quality because of the high, and increasing, level of nutrients. Nutrients enter the lake through stormwater runoff or streams flowing into the lake. Sources of nutrients in the watershed include: fertilizers, pet waste, and erosion from construction and land clearing. Nutrients may also directly enter the lake through poorly maintained septic systems. Measures to control nutrients in the watershed should be taken now to prevent future negative impacts to the lake. To find out how to protect lake water quality and to find more information on the impacts of elevated lake nutrient levels visit www.lakes.surfacewater.info.

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DATA SUMMARY FOR LAKE ROWLAND				
Source	Date	Water Clarity (Secchi depth in meters)	Total Phosphorus (ug/l)	
			Surface	Bottom
Volunteer	1994	1.0 - 1.8 (1.5) n = 9	-	-
Volunteer	1995	1.5 - 1.6 (1.5) n = 4	-	-
Volunteer	1996	1.6 - 2.3 (1.8) n = 6	-	-
Volunteer	1997	1.6 - 2.0 (1.7) n = 5	-	-
SWM Staff or Volunteer	1998	1.3 - 2.1 (1.7) n = 7	47	61
Volunteer	1999	1.4 - 2.2 (1.9) n = 5	-	-
SWM Staff or Volunteer	2000	1.8 - 2.2 (2.0) n = 4	30	39
SWM Staff or Volunteer	2001	1.7 - 2.1 (1.9) n = 4	35	53
SWM Staff or Volunteer	2002	1.9 - 2.7 (2.3) n = 5	26 - 39 (31) n = 4	73 - 253 (199) n = 4
SWM Staff or Volunteer	2003	1.6 - 1.9 (1.7) n = 3	23 - 39 (29) n = 3	134 - 354 (271) n = 3
SWM Staff or Volunteer	2004	1.1 - 2.2 (1.7) n = 4	38 - 42 (40) n = 3	244 - 341 (306) n = 3
SWM Staff or Volunteer	2005	-	-	-
Volunteer	2006	1.1 - 1.9 (1.5) n = 8	24 - 38 (32) n = 4	189 - 315 (242) n = 4
Volunteer	2006	1.1 - 1.9 (1.5) n = 8	24 - 38 (32) n = 4	189 - 315 (242) n = 4
Volunteer	2007	1.4-1.8 (1.6) n=7	16-30 (23) n=4	132-352 (268) n=4
Long Term Avg		1.8 (1994-2007)	33 (1998-2007)	180 (1998-2007)
TRENDS		None	None	Increasing

NOTES

- Table includes summer (May-Oct) data only.
- Each box shows the range on top, followed by summer average in () and number of samples (n).
- Total phosphorus data are from samples taken at discrete depths only.
- "Surface" samples are from 1 meter depth and "bottom" samples are from 1-2 meters above the bottom.