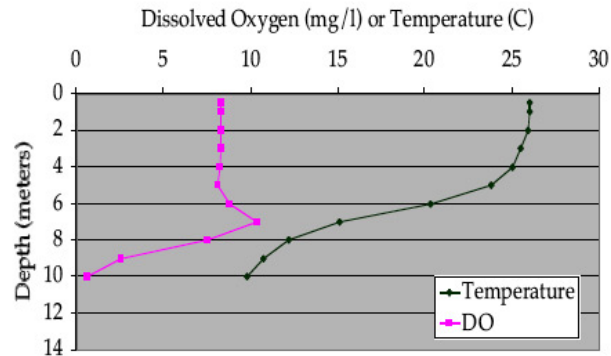


Crystal Lake Orleans OR-153

Acreage: 38
 Maximum Depth: 44 ft
 2001 Secchi Dip: 21.9 ft
 Lake Association:
 Friends of Crystal Lake



Dissolved Oxygen and Temperature
Crystal Lake, 8/28/01

OVERVIEW

Crystal Lake is located southeast of the intersection of Pond Road and Route 28. This lake is recharged with groundwater flowing from the west and discharges surface flow to groundwater along its northeast and east shore. On the northeast shore an intermittent stream discharges into the pond from a wetland area and a surface outlet drains into a cranberry bog ultimately leading into the tidal Kescayogansset Pond. The lake shoreline is moderately developed with single family homes. Public access is provided by a paved boat ramp on the northwest end and a small public beach on the southeast shore. Recreational uses include swimming, boating and fishing. The lake is stocked with trout each spring and fall.

WATER QUALITY

Crystal Lake was sampled in 1948, 2001, and 2002. In 1948, the August 19 temperature profile indicated a well-mixed upper layer (*i.e.*, epilimnion) to 18 ft with waters 8 to 15°F cooler below 20 ft. The dissolved oxygen (DO) profile had near saturation concentrations in the epilimnion and deeper concentrations beginning at 9.2 ppm at 25 ft and declining to anoxic (<1 ppm) conditions at the bottom (38 and 42 ft readings). Between May and November 2000, Crystal Lake was the subject of a town-initiated water quality study (OWQTF, 2001). The monitoring during this study found anoxic concentrations (<1 ppm DO) in the deepest waters about a month following the beginning of thermal stratification (early-June) with a progressively thicker, deep anoxic layer as summer progressed. The 2001 PALS Snapshot profiles (shown above) show an anoxic layer of approximately 4 m (13.1 ft) at the bottom of the lake, which is close to the maximum observed during 2000.

Chlorophyll *a*, TP, and TN concentrations measured in the upper three samples from Crystal Lake are generally less than or slightly above current Cape Cod "impacted" thresholds, while the nutrient concentrations at depth exceed these thresholds. The Carlson TSI based on the surface chlorophyll *a* concentrations places the pond at the middle of the oligotrophic with some bottom anoxia category.

The water quality study concluded that additional sampling, including sediments and stormwater from nearby roads, including Route 6, was necessary to better understand Crystal Lake's water quality. It is clear from reviewing the DO profiles that this pond is impaired, has worsened over the past 50 years, and consideration of information from other ponds discussed in this Pond Atlas suggests that the 1948 conditions were impaired as well. The Orleans Water Quality Task Force collected more refined data during the summer of 2002; it is recommended that the town consider a revised water quality assessment of the Crystal Lake, including a review of this more refined data and include a sediment characterization and stormwater sampling and a forecast of whether water quality is likely to continue to worsen. Overall, Crystal Lake presents as an impacted pond with current water quality problems.

August 28, 2001 PALS Snapshot Results					
Depth	pH	Chlorophyll a	Alkalinity	Total Phosphorus	Total Nitrogen
meters		µg/L	as mg CaCO3/L	µg/L	mg/L
0.5	6.24	1.87	2.3	8.1	0.29
3	6.27	1.18	2.6	8.1	0.32
9	5.83	1.29	3.1	13.0	0.26
12.5	6.25	1.36	12	73.4	0.59

[Click here to see Bathymetric Map of Crystal Pond](#)

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