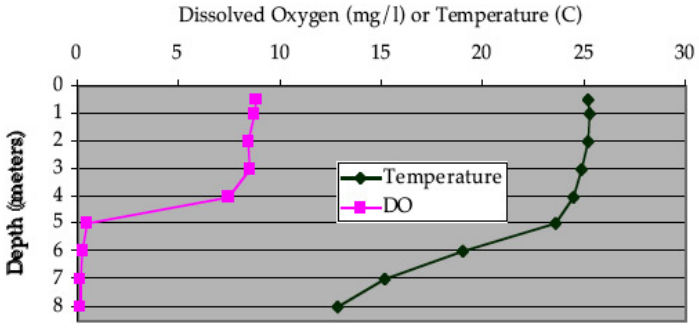
Pilgrim Lake
Orleans
OR-176

Acreage: 44.7
Maximum Depth: 28 ft
2001 Secchi Dip: 5.8 ft
Lake Association:
Friends of Pilgrim Lake



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

OVERVIEW

Pilgrim Lake is located east of Route 28 and south of Monument Road. The lake is recharge by groundwater flow from the west and discharges surface flow to the groundwater along the north, south, and east shorelines. There is a herring run leading to the tidal Kescayogansett Pond at the northern end of the lake. The shoreline is lightly developed with single family homes and cottages. A large public beach area and boat ramp are located on the northeast shore. Recreational activites include fishing, boating and swimming.

WATER QUALITY

Pilgrim Lake was sampled in 1980, 2001, and 2002. In 1980, the July 29 temperature and dissolved oxygen (DO) profiles indicated a well-mixed water column with a slight drop in temperature at the bottom of the lake. Between 2000 and 2001, Pilgrim Lake was part of a town-initiated water quality study (Scanlon and Meservey, 2001). Profiles collected showed the onset of thermal stratification in early June with a well-mixed upper layer (*e.g.*, epilimnion) to 3 m followed by a gradual deeping of the layer to 5 m as the summer progressed. Below the epilimnion, there was a gradual lowering of temperature with depth, but without the formation of a true hypolimnion. Deep dissolved oxygen concentrations declined with the onset of stratification, attaining a ~1.5 m thick layer of anoxic water on the bottom of the lake from July through September. In an apparent worsening, the 2001 PALS Snapshot profile (see above) shows a ~3.5 m layer of anoxic water on the bottom.

All the chlorophyll *a*, TP, and TN concentrations measured during the 2001 PALS Snapshot (shown below) exceed the current Cape Cod "impacted" thresholds, with the deep TP being the second highest recorded during the Snapshot. The Carlson TSI based on the surface chlorophyll *a* concentrations places the pond at the middle of the eutrophic category.

The water quality study concluded that additional sampling, including sediments, was necessary to better understand Pilgrim Lake's water quality. It is clear from reviewing the DO profiles that this pond is impaired and that this impairment appears to have occurred over the past 20 years. 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 Pilgrim Lake, including a review of this more refined data and include a sediment characterization, a land use assessment of shoreline and watershed properties, clarification of differences between 2000 and 2001 results, and a forecast of whether the water quality problems are likely to continue to worsen. Overall, Pilgrim 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	6.72	15.17	10.9	13.0	0.56
7.5	6.18	5.62	24.6	455.3	0.59

Click here to see Bathymetric Map of Pilgrim Pond

Return to Orleans Ponds Map