Our Lakes Health– Water Quality Monitoring Results

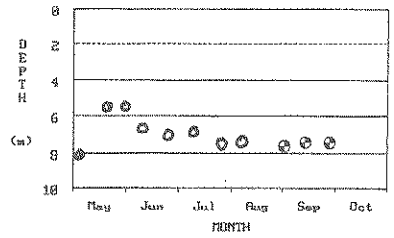
Here's a close look at our secchi disk charts. Please remember that the lower a disk appears on the chart, the better, as it means the disk could be lowered deeper in the water before going out of sight, hence clearer. Water clarity is an important indicator of lake health.

These charts have been meticulously assembled from data obtained from many people's dedicated efforts. RWPA would like to thank the water quality monitors on each of Raymond's lakes for their dedication to obtaining accurate data that allows us to track trends in water quality. The chart to the left shows our current monitors and the number of years of service to our lakes.

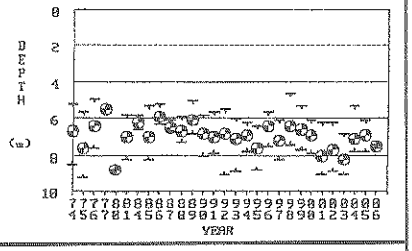
Lake	Monitor	# Years
Crescent Lake	Elden Lingwood Waldo Preble	2 7
Notched Pond	Gary Bucklin	4
Panther Pond	Charlie Turner	31
Raymond Pond	Bev Daniels Susan Moore	0 0
Sebago Lake	Joseph Potts	18
Thomas Pond	Mark Mattson	14

Panther Pond

2006 Transparency Data

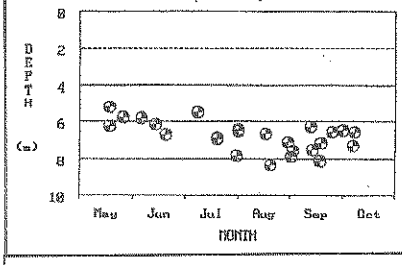


Yearly Mean Transparency Data

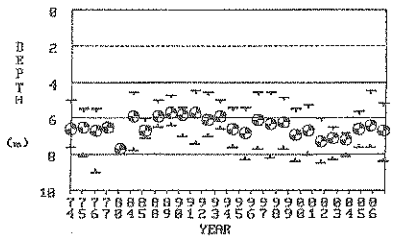


Crescent Lake

2006 Transparency Data



Yearly Mean Transparency Data

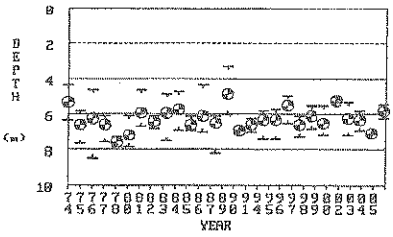


Raymond Pond

2006 Transparency Data

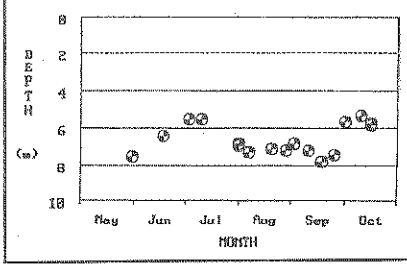
No secchi disk readings were completed in 2006. New monitors are trained for 2007 season.

Yearly Mean Transparency Data

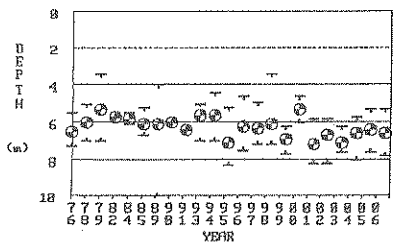


Thomas Pond

2006 Transparency Data

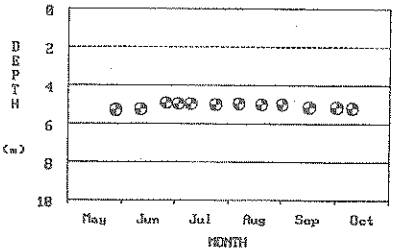


Yearly Mean Transparency Data

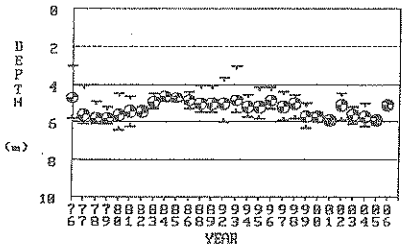


Notched Pond

2006 Transparency Data

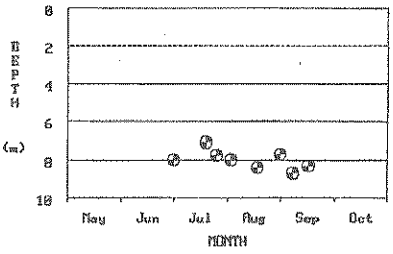


Yearly Mean Transparency Data

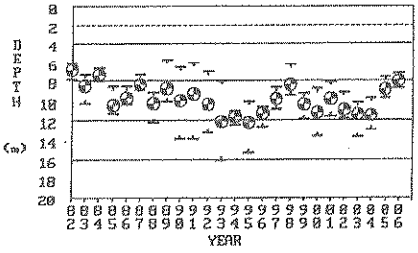


Sebago Lake

2006 Transparency Data

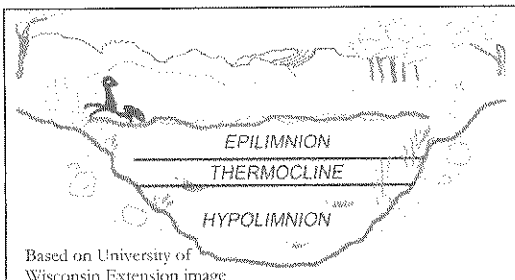


Yearly Mean Transparency Data



A Typical Year in the Life of Raymond Lakes

The concentration of dissolved oxygen (DO) is another critical indicator of the health and quality of lakes and ponds. An adequate supply of DO is essential to fish and other aquatic life. Take a good look at the six graphs here. DO is represented by the dotted line and temperature is the solid black line. When the testing begins in May (Fig. 1) note that there are uniform DO concentrations from the surface to the bottom. This is because the lake has recently undergone spring turnover, when mixing from top to bottom takes place. The almost horizontal part of the temperature line indicates that surface water has already begun warming up, creating the thermocline. The thermocline (middle layer) physically isolates the deep, cold bottom water from the surface water, preventing oxygen replacement from the air. June (Fig. 2) shows that DO is already starting to decline at lower depths. July (Fig 3) represents more of the same, with fish being forced up from the deepest depths because DO levels are too low to sustain them - fish need around 3-5 parts per million (ppm). Fisherman take note. August (Fig. 4) indicates that almost all the DO has been consumed by bottom sediments and surface temperatures have leveled off. September (Fig. 5) shows us that DO has all but vanished from lower levels, forcing fish into even shallower depths. Lastly, October (Fig. 6) diagrams a sinking thermocline, brought on by cooler temperatures, and complete collapse of DO below 18 meters. Soon, DO near the bottom will be replenished (fall turnover), usually just before ice formation. No wonder loons like to stay so late into the fall. Please note that temperatures at the lake bottom have varied by less than 4 degrees for the entire year. Through all this, be reminded that waters' greatest density is at 39 degrees F (~ 4 degrees C) - refer to "lake turnover" definition below to understand how water density influences lake turnover. So there it is, a year in the life of a lake, which is anything but a simple repository for water. So you can see that our lakes have many, many variables that affect their "lives." Graphs courtesy of Roy Bouchard, DEP.



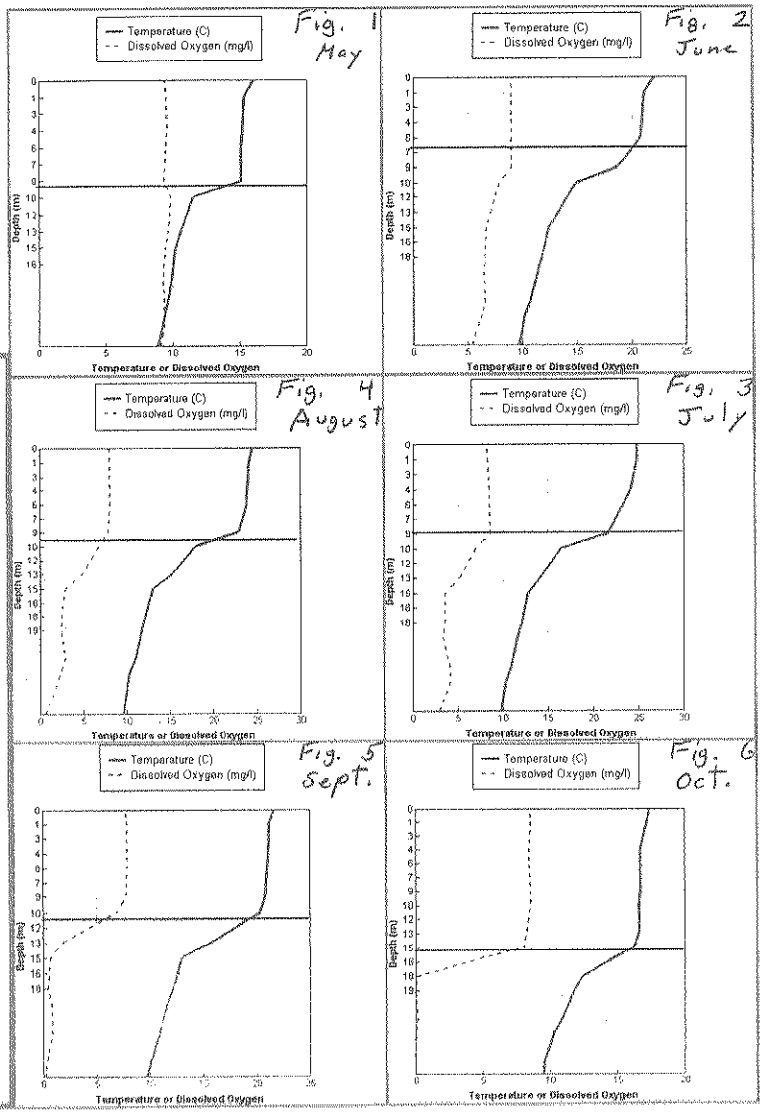
Based on University of Wisconsin Extension image

Thermal Stratification

As lake water is warmed in the summer the water in deeper lakes is layered into three levels:
1) warmer (less dense) epilimnion layer at the surface
2) the thin thermocline (transition) layer
3) the cold, deep (high density- heavy) hypolimnion

Note, not all lakes experience thermal stratification, it depends on depth and weather influence.

Information courtesy of the Volunteer Lake Monitoring Program



Dissolved Oxygen (DO) - the amount of oxygen dissolved in the water. DO concentration is affected by water temperature, water quality, and other factors.

Lake Turnover - The process of mixing that occurs in many lakes and ponds in the spring and fall. Turnover takes place when the water temperature is uniform from surface to bottom. Water is most dense (heaviest) at 39° F (4° C) and as temperature increases or decreases from 39° F, it becomes increasingly less dense (lighter). In summer and winter, lakes are maintained by climate in what is called a stratified condition– less dense water is at the surface and more dense water is near the bottom. During late summer and autumn, air temperatures cool the surface water causing its density to increase. The heavier water sinks, forcing the lighter, less dense water to the surface. This continues until the water temperature at all depths reaches approximately 39° F. Because there is very little difference in density at this stage, the waters are easily mixed by the wind. The sinking action and mixing of the water by the wind results in the exchange of surface and bottom waters which is called "turnover." During the spring, the process reverses itself. This time ice melts, and surface waters warm and sink until the water temperature at all depths reaches approximately 39° F. The sinking combined with wind mixing causes spring "turnover."