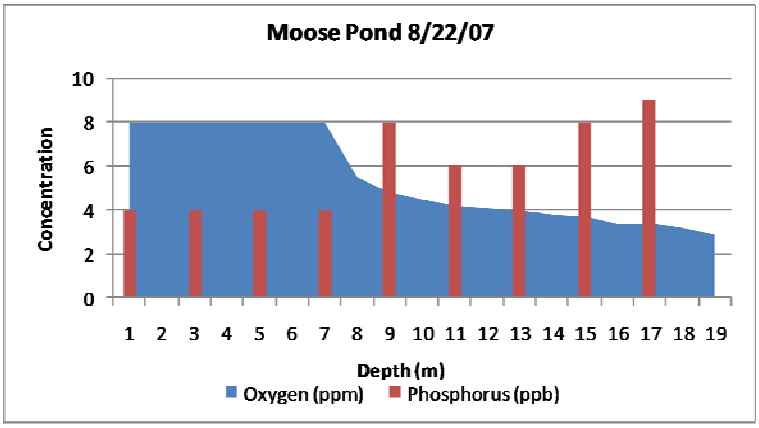
2007 LEA Moose Pond Summary:

Moose Pond (Main Basin) – The 2007 Secchi disk average of 7.6 meters was deeper than the long-term average of 7.4 meters for the main basin. Dissolved oxygen depletion first appeared in early August in the bottom waters of the pond. The depletion increased for the rest of the summer, impacting the bottom 10 meters of the pond by September. Phosphorus concentrations in the upper waters averaged 6.0 ppb, which is below the long-term average of 6.1 ppb. Phosphorus concentrations below the thermocline were moderate and averaged 7.4 ppb. Color averaged 13 SPU for the year, which is just below the long term average of 14 SPU and pH was the same as the long term average of 6.8. Chlorophyll levels were moderate at 3.1 ppb, which is just above the long-term average of 3.0 ppb. Conductivity averaged 30 µs, which is below the long term average of 40 µs and average alkalinity was 7 ppm, which is the same as the long term average. Dissolved oxygen depletion was severe in August and September and continues to limit the amount of suitable habitat for cold-water fish in the pond. For this reason, the main basin of Moose Pond is in the HIGH degree of concern category.



Surface Area:	1,617 acres
Maximum Depth:	70 feet
Mean Depth:	20 feet
Volume:	30,722 acres/feet
Watershed Area:	11,170 acres
Flushing Rate:	3.69 flushes per year
Elevation:	418 feet

Moose Pond Quick Statistics
2007 Average Verses the Long Term Average:

Secchi : Better
Chlorophyll: Worse
Phosphorus: Better

Moose Pond (North Basin)- The 2007 Secchi disk average of 5.5 meters was deeper than the long-term average of 5.1 meters. Dissolved oxygen depletion was not observed this year. Phosphorus concentrations in the surface waters were moderate at 6 ppb, which is below the long term average of 9.6 ppb. Alkalinity was 7 ppm, which is close to the long term average of 8 ppm and color was 15 SPU, which is below the long term average of 20 SPU. Chlorophyll levels were moderate at 2.2 ppb, which is below the long term average of 3.6 ppb. Conductivity was 24 µs, which is under the long term average of 34 µs and pH was 6.8 for the year. Due to periodic dissolved oxygen depletion in the bottom waters, the north basin remains in the MODERATE degree of concern category.

Water Quality Testing Parameters

LEA's testing program is based on parameters that provide a comprehensive indication of overall lake health. Tests are done for transparency, temperature, oxygen, phosphorus, chlorophyll, color, conductivity, pH, and alkalinity.

Transparency is a measure of clarity and is done using a Secchi disk. An 8 inch round disk divided into black and white quarters is lowered into the water until it can no longer be seen. The depth at

which it disappears is recorded in meters. Transparency is affected by the color of the water and the presence of algae and suspended sediments.

Temperature is measured at one-meter intervals from the surface to the bottom of the lake. This sampling profile shows thermal stratification in the lake. Lakes deep enough to stratify will divide into three distinct layers: the epilimnion, metalimnion, and hypolimnion. The epilimnion is comprised of the warm surface waters. The hypolimnion is made up of the deep, colder waters. The metalimnion, also known as the thermocline, is a thin transition zone of rapidly decreasing temperature between the upper and lower layers. Temperature is recorded in degrees Celsius.

Phosphorus is a nutrient that is usually present in only small concentrations in the water column. It is needed by algae for growth and reproduction and can therefore give an indication of the potential for an algal bloom. Algal blooms caused by excess phosphorus loading can deplete dissolved oxygen levels in deep water. Phosphorus is measured in parts per billion (ppb).

Dissolved oxygen is also measured at one-meter intervals from the surface to the bottom of the lake. Over the course of the summer, oxygen is depleted in the bottom waters through the process of decomposition of organic matter like dead algae. When there is excessive decomposition, all available oxygen is used up and coldwater fisheries are threatened. If dissolved oxygen concentrations are significantly depleted in bottom waters, a condition occurs which allows phosphorus to be released into the water column from bottom sediments. This is called phosphorus recycling and can cause increased algal growth to further deplete lake oxygen levels. During the fall, cooler temperatures and winds cause the lake to de-stratify and oxygen is replenished in the deep waters as the lake "turns over" and mixes. The same mixing of waters occurs in the early spring right after ice-out. Dissolved oxygen is measured in parts per million (ppm).

Chlorophyll-A is a pigment found in algae. Chlorophyll sampling in a lake gives a measure of the amount of algae present in the water column. Chlorophyll concentrations are measured in parts per billion (ppb).

Conductivity measures the ability of water to carry electrical current. Pollutants in the water will generally increase lake conductivity. Fishery biologists will often use measurements of conductivity to calculate fish yield estimates. Conductivity is measured in micro Siemens (µs).

Color is a measure of tannic or humic acids in the water. These usually originate in upstream bogs from organic decomposition. Chlorophyll results are more important on lakes that are highly colored because phosphorus and transparency results in those lakes are less accurate. Color is measured in Standard Platinum Units (SPU).

pH is important in determining the plant and animal species living in a lake because it reflects how acidic or basic the water is. pH is a measurement of the instantaneous free hydrogen ion concentration in a water sample. Bogs or highly colored lakes tend to be more acidic (have a lower pH).

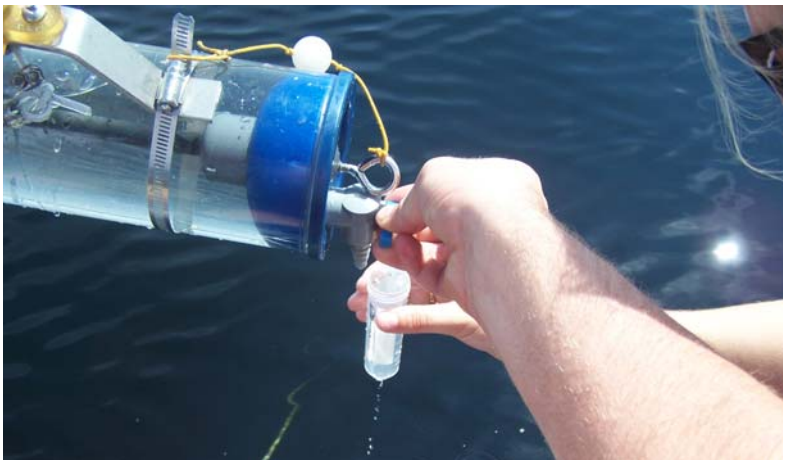
Alkalinity is a measure of the amount of calcium carbonate in the water and it reflects the ability of the water to buffer pH changes. In Maine lakes, alkalinity generally ranges from 4 - 20 parts per million (ppm). A higher alkalinity indicates that a lake will be able to withstand the effects of acid rain longer than lakes with lower alkalinity. If acidic precipitation is affecting a lake, a reduction in alkalinity will occur before a drop in pH.

Water Quality Classification

While all lakes are sensitive to land use and activities within their watershed, the health and longevity of some lakes is more precarious than others. LEA classifies lakes into categories based on their overall health and susceptibility to algal blooms. Lakes in the *Average Degree of Concern* category are those lakes that are not currently showing water quality problems that are likely a result of human activity. The *Moderate Degree of Concern* category describes lakes where testing shows routine dissolved oxygen depletion, elevated phosphorus levels or a potential for phosphorus recycling. The *High Degree of Concern* category is reserved for those lakes that routinely show signs of phosphorus recycling, have a cold water fishery that is regularly impacted by oxygen depletion or have had algal blooms in the past.

The following criteria are used for reviewing transparency, phosphorus, chlorophyll and color data for each lake:

Transparency (m) in meters		Phosphorus (ppb) in parts per billion		Chlorophyll-A (ppb) in parts per billion		Color (SPU) Standard Platinum Units	
10.0 +	excellent	less than 5.0	low	less than 2.0	low	less than 10.0	low
7.1 – 10.0	good	5.1 – 12.0	moderate	2.1 – 7.0	moderate	10.1 – 25.0	moderate
3.1 – 7.0	moderate	12.1 – 20.0	high	7.1 – 12.0	high	25.1 – 60.0	high
less than 3.0	poor	20.1 +	very high	12.1 +	very high	60.1 +	very high



An intern pours off water from a deep water grab to be analyzed later for phosphorus concentration.