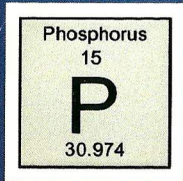
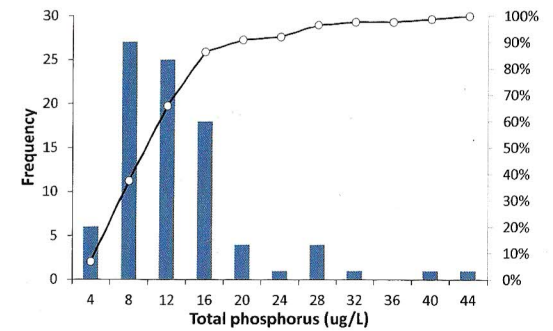


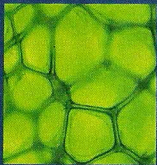
## Phosphorus



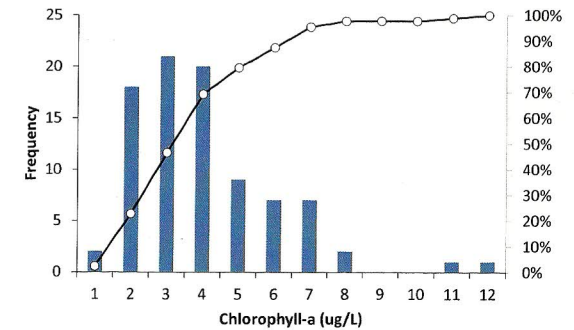
Phosphorus is of major importance to structure and metabolism of all organisms. In freshwater systems, phosphorus exists in relatively small amounts compared to other essential nutrients. The addition of extra phosphorus allows algal production to increase greatly because all other essential elements are usually available in excess. Weathering slowly releases phosphorus from rocks and soils into aquatic systems; however, phosphorus can rapidly enter water through fertilizers, wastewater, and agricultural runoff. Generally speaking, Adirondack lakes of low productivity have total phosphorus concentrations less than 10  $\mu\text{g/L}$ , while highly productive lakes have concentrations greater than 20  $\mu\text{g/L}$ .



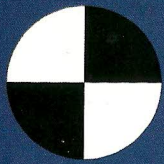
## Chlorophyll



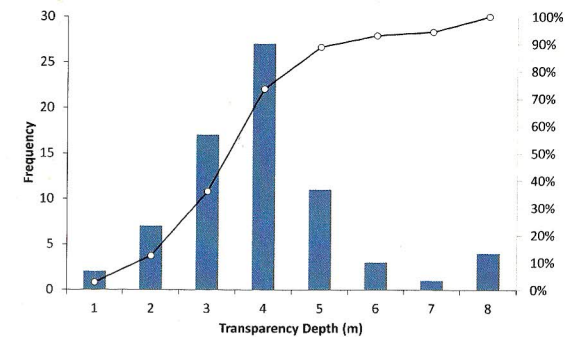
Chlorophyll-a is the primary photosynthetic pigment found in algae and cyanobacteria. Quantifying algal biomass in a lake is a difficult undertaking; however, a measurement of chlorophyll is a relatively simple and inexpensive analysis that can provide a surrogate measure of algal productivity. Typically, major changes in algal biomass (e.g. an algae bloom) are related to changes in the availability of nutrients, primarily phosphorus or nitrogen, or at times, silica or inorganic carbon. Typically, Adirondack lakes with low algal productivity will have average chlorophyll concentrations less than 2  $\mu\text{g/L}$ , while highly productive lakes often have average concentrations greater than 8  $\mu\text{g/L}$ .



## Transparency



Transparency is a measurement of light penetration through the water. Many factors can influence light penetration, including algal abundance and dissolved or suspended material. Transparency can be highly variable between lakes as well as within a single lake over the course of a year. Low transparency is not necessarily a cause for concern, especially in the Adirondacks, where dissolved organic material from wetlands has a large control over light penetration. The most important feature of transparency is the long-term trend, which indicates changes in the components of the water.



## Trophic State



Trophic state is an organizing concept used to locate a waterbody on a continuum of productivity. Oligotrophic lakes have low nutrients and low biological productivity. These lakes are typically deep, with high transparency and adequate oxygen near the bottom. Eutrophic lakes have excess nutrients and support elevated productivity. These lakes tend to be shallow, exhibit depressed transparencies, and possess anoxic bottom water. Mesotrophic is an intermediate classification on the continuum between oligotrophic and eutrophic. In Adirondack Lakes, trophic state can generally be assessed with chlorophyll concentration, where values below 2.0 being indicative of the oligotrophic state, and values greater than 8.0 suggesting the eutrophic state.

