**Carlson Trophic Status Index**

The Carlson Trophic Status Index (TSI) is a tool used to summarize measurements of water quality into one index value. This value can be used to compare lakes in the same region or as a historical comparison of improvement/degradation over time. In many ways, the index can be viewed as a measure of the potential for algal productivity. Since most people value lakes with high clarity and low algal productivity, the lower the TSI value the healthier the lake is considered to be.

TSI is calculated using 3 measurements: total phosphorus, chlorophyll *a*, and Secchi disk depth. Phosphorus is a requirement for plant growth. When phosphorus concentrations are high, large amounts of plant (including algae) growth can be supported. Phosphorus is most often the limiting factor, and therefore the most important factor to control in order to prevent overgrowth of plant and algae biomass. All green plants contain Chlorophyll *a*, which allows Chlorophyll *a* concentrations to be used as an estimate of overall plant/algae biomass. A Secchi Disk is a white plastic or metal disk used to measure the clarity or transparency of the water. The depth at which the disk is no longer visible is the Secchi Disk Reading.

|  |  |  |
| --- | --- | --- |
| **TSI Value** | **Trophic Status** | **Lake Characteristics** |
| 0 - 40 | Oligotrophic | Clean Lake – water is clear with normal algae levels |
| 41 - 50 | Mesotrophic | Temporary algae/aquatic plant problems |
| 51 - 70 | Eutrophic | Persistent algae/aquatic plant problems |
| 71 + | Hypereutrophic | Extreme algae/aquatic plant problems |

**Data Legend**

**Sample By:** Name of person(s) who took water samples

**Date:** Date the sampling occurred

**Sample ID:** Location of the sampling – Site 204 is located at Lat, Lon 46.45505,-94.274186

**Code #**

**TP (ppb):** Total Phosphorus (parts per billion)

**Chla (ppb):** Total Chlorophyll *a* (parts per billion)

**Secchi (ft):** Depth, in feet, at which the Secchi Disk is no longer visible

**TSI (P):** Trophic Status Index for Phosphorus

**TSI ©:** Trophic Status Index for Chlorophyll *a*

**TSI (S):** Trophic Status Index for Secchi

**TSI Avg:** Average of TSI P,C & S

**H2O Temp (F):** Water temperature at samle site