

Table 8. Changes in Temperate Lake Attributes According to Trophic State
(Gibson et al. 2000, adapted from Carlson and Simpson 1996).

TSI Value	SD (m)	TP (µg/L)	Attributes	Water Supply	Recreation	Fisheries
<30	>8	<6	Oligotrophy: Clear water, oxygen throughout the year in the hypolimnion			Salmonid fisheries dominate
30-40	8-4	6-12	Hypolimnia of shallower lakes may become anoxic			Salmonid fisheries in deep lakes
40-50	4-2	12-24	Mesotrophy: Water moderately clear but increasing probability of hypolimnetic anoxia during summer	Iron and manganese evident during the summer. THM precursors exceed 0.1 mg/L and turbidity >1 NTU		Hypolimnetic anoxia results in loss of salmonids. Walleye may predominate
50-60	2-1	24-48	Eutrophy: Anoxic hypolimnia, macrophyte problems possible	Iron, manganese, taste, and odor problems worsen		Warm-water fisheries only. Bass may be dominant
60-70	0.5-1	48-96	Blue-green algae dominate, algal scums and macrophyte problems		Weeds, algal scums, and low transparency discourage swimming and boating	
70-80	0.25-0.5	96-192	Hypereutrophy (light limited). Dense algae and macrophytes			
>80	<0.25	192-384	Algal scums, few macrophytes			Rough fish dominate, summer fish kills possible

Table 9. Conditions Associated with Various Trophic State Index Variable Relationships
(Gibson et al. 2000).

Relationship Between TSI Variables	Conditions
TSI (CHL) = TSI(CHL) = TSI(SD)	Algae dominate light attenuation
TSI(CHL) > TSI(SD)	Large particulates, such as Aphanizomenon flakes, dominate
TSI(TP) = TSI(SD) > TSI(CHL)	Nonalgal particulates or color dominate light attenuation
TSI(SD) = TSI(CHL) > TSI(TP)	Phosphorus limits algal biomass (TN/TP ratio greater than 33:1)
TSI(TP) > TSI(CHL) = TSI(SD)	Zooplankton grazing, nitrogen, or some factor other than phosphorus limits algal biomass