

MISSISSIPPI MAKEOVER

A Plan for Restoration, Just Around the Bend

Indicator: Water Clarity



Water clarity is simply, how far you can see into the water. It is influenced by the amount of suspended and dissolved material in the water. Suspended material in the water is often referred to as **total suspended solids (TSS)**. It includes both organic solids, such as algae, and inorganic solids such as sediment. Dissolved organic material in water will produce a stained color that will reduce water clarity. Common measurements of water clarity include **turbidity** and **Secchi disk transparency**.

Turbidity is a measure of the light scattering properties of water and is measured using a turbidity meter, with results usually reported as Nephelometric Turbidity Units (NTU's) or a similar unit. As turbidity increases and NTU values are higher, light disappears more rapidly with depth due to scattering and absorption. Lake Pepin is impaired for turbidity. In the reach just above Lake Pepin, turbidity during the summer averaged 32.6 NTU's over the past 16 years. The state standard is 25 NTU's.

Secchi disk transparency is a simple, inexpensive, and straight-forward method of measuring water clarity. A black and white disk, 20-cm in diameter, is lowered into the water on the shaded side of the boat until it disappears and then raised until it reappears. The average of these two depths is recorded as the Secchi disk transparency. This is not an exact measurement, as the sun's glare or the surveyor's eyesight can affect the readings, however, due to its simplicity and relative accuracy, it is a widely used and commonly accepted measurement of water clarity. In the reach just above Lake Pepin, Secchi disk transparency averaged 41.0 cm from 1993-2007, while during the same period Secchi disk transparency averaged 94.9 cm at the lower end of Lake Pepin. Secchi disk readings from throughout Lake Pepin 1993 – 2007 are:

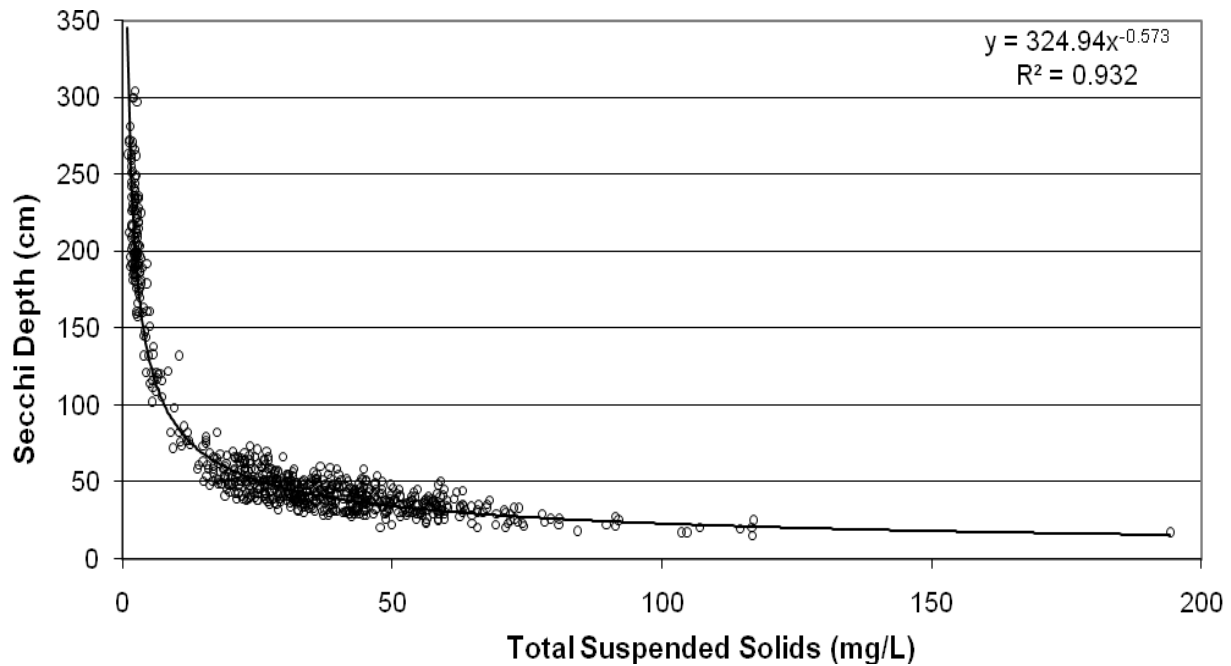


	Mean	Median	Minimum	Maximum
Lake wide	68.1	63.0	17	358
Frontenac SP	47.0	44.0	17	122
Stockholm	58.4	57.0	18	170
Lake City	73.2	72.0	25	196
Maple Springs	94.9	88.0	38	358

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Because total suspended solids, turbidity, and Secchi transparency are all closely related parameters, it is possible to fit mathematical equations to the data that allows a reasonable prediction of one parameter based on another. Equations were fit to the relationship between total suspended solids and Secchi disk transparency, and between turbidity and Secchi disk transparency. Data were used from the main channel above Lake Pepin.

Secchi depth related to total suspended solids



Secchi depth related to turbidity

