Cooperative Lakes Monitoring Program

Fact Sheet

Secchi Disk Transparency

What do measurements with a Secchi Disk tell us about a lake?

What is transparency?

Transparency, also referred to as water clarity, is a measure of how far light can travel in water.

What affects transparency?

Transparency is directly affected by the level of suspended particles and dissolved materials in the water.

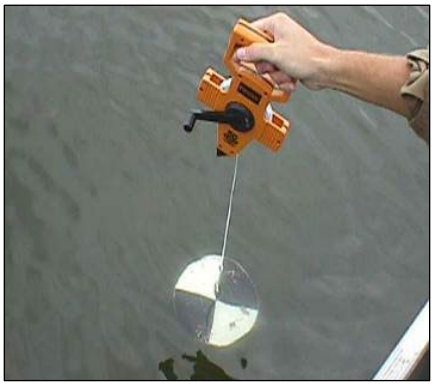
The main types of suspended particles that affect transparency are algae and sediment. Algae are naturally occurring microscopic plant life found in most water bodies. Algae are a part of a healthy aquatic ecosystem, but their populations can increase dramatically when there are high nutrient inputs into a lake. Too much algae can block sunlight from penetrating deeper into the water, restricting plant growth and altering the balance of the ecosystem.

Suspended sediments can come from many sources. During storm events, runoff can carry clay, silt, and sand from streets, yards, fields, and construction sites into streams and lakes. In shallow waters, boats and high winds can stir up bottom sediments. Also in shallow waters, aquatic life, such as carp and crayfish, can stir up the lake sediment. For some lakes, whiting events caused by the formation of fine particles of calcium carbonate (marl) in the water is a major factor affecting transparency.

Dissolved substances in the water can also change water transparency by changing the color of the water. For example, 'tea' stained lakes have high amounts of dissolved organic matter leached from the surrounding landscape that will result in a lake with lower water transparency.

Why is transparency important?

Transparency is a basic and important indicator of aquatic ecosystem quality. When transparency is measured consistently week to week and year to year, these measurements are a useful indicator of water quality changes and patterns. When assessed along with other parameters such as chlorophyll *a* and total phosphorus, transparency measurements give us a useful insight into the level of biological productivity in a lake, and ultimately its water quality conditions.



The Secchi disk is named after Pietro Angelo Secchi, who in 1865 used a white disk to take transparency measurements in the Mediterranean Sea.

How is transparency measured?

Transparency is most commonly measured using a Secchi disk. This gives a direct measure of the depth that sunlight penetrates through the water. The Secchi disk is a weighted steel or heavy plastic disk, eight inches in diameter, attached to a line with calibrated measurements.

In the Cooperative Lakes Monitoring Program (CLMP), volunteer monitors measure transparency by lowering the disk down into the water until it is no longer visible, noting the depth on the calibrated line, pulling the disk up until it is visible again, and noting the depth a second time. The Secchi disk transparency is the average of these two depths, rounded to the nearest half foot.

CLMP volunteers measure Secchi disk transparency regularly from mid-May through mid-September. Repeated measurements are necessary throughout the growing season since algal species composition in lakes can change significantly during the spring and summer months, dramatically impacting overall water clarity.

Michigan Clean Water Corps

MiCorps is funded by the Michigan Department of Environment, Great Lakes, and Energy and administered in partnership with Michigan State University Extension, Michigan Lakes and Streams Association, and the Huron River Watershed Council.