Procedure to Measure Water Transparency (Secchi Disk Depth) in Province Lake

Function:

To measure the transparency of the lake water at the sampling station.

Rationale:

Water clarity fluctuations correlate to differences in algal and cyanobacterial populations, silt, and water color.

Measurements can be affected somewhat by sun height, weather conditions, boat traffic, and day of the week (due to activity) as well as by the details of how the measurements are taken.

Preparation & Planning:

All equipment must be in good working order. The paint on the Secchi Disk should not be chipped or discolored. If the Secchi Disk is chipped or discolored, it can be repainted with flat black and flat white Rustoleum paint (never use gloss finishes when repainting the Secchi Disk). Also, the inside of the viewscope should be flat black to reduce glare.

The viewscope should be examined prior to each sampling trip. If the Plexiglas plate is coated with dust, clean the plate off with tap water. Dust on the Plexiglas plate will yield artificially low water transparency readings.

The Secchi Disk measurement should be taken as close to solar noon as possible. This ensures that the maximum amount of sunlight enters the lake. Solar noon at Province Lake is at approximately 12:45 PM EDT during the summer. However, anytime between 10:00 AM and 3:30 PM is acceptable. Right after lunch is a good time to plan for, on a day that is not too windy.

Procedure:

1. Drive your motor boat out to the deep area of the lake. The following GPS coordinates were measured for the "Deep Spot", north of mid-lake on a sampling trip in 2005. You do not need to be exactly at that point, just in the general vicinity, within a few hundred yards. The coordinates are given three different ways so that hopefully one will match the format your GPS unit uses:

Latitude	Longitude	Latitude		Longitude		Latitude			Longitude		
Deg	deg	deg	min	deg	min	deg	min	sec	Deg	min	sec
43.6944	70.9926	43	41.663	70	59.555	43	41	39.8	70	59	33.3

2. Approach your target point slowly and aim to drift to a stop. Your goal is to be able to place your anchor carefully, raising little or no any sediment from the lake bottom.

3. Once anchored, look around you and record the trip data on your data sheet. If you do not have real-time GPS data, consider if you have another device, such a GPS-equipped camera, that can record the coordinates that you can retrieve later. If you have no GPS device of any sort, write "N/A" for "Not Available".

4. The Secchi Disk should always be lowered on the shaded side of the boat first. *Never take a Secchi Disk reading while wearing sunglasses or tinted glasses*. You will start by taking observations WITHOUT a viewscope, in order to match the method used since 1991, continuing a consistent dataset.

5. Slowly lower the Secchi Disk until it disappears from view, immediately stop lowering the line, and mark the point of disappearance (where the line just touches the water). Lower the disk a few more inches below the point of disappearance. Raise the disk until light can just be seen reflecting upward from the white surface of the disk and mark the point of reappearance. **See the detailed technique document for the best way to do this.**

6. The average between these two points (the point of disappearance and the point of reappearance) is taken as the Secchi Disk transparency. Record the disappearance and reappearance depths and/or the average transparency on the data sheet.

7. One or more people on board should repeat this procedure and data should be recorded for all observers. If you are alone, record your data, then do it a second time.

8. Next, if you have a viewscope, place it into the water so the Plexiglas plate is flush with the water. There should be no air bubbles between the Plexiglas plate and the water; if necessary, tilt the viewscope to allow air bubbles to escape.

9. Look through the viewscope and wait 30 seconds while your eyes to adjust to the darker lighting. Slowly lower the Secchi Disk until it disappears from view, immediately stop lowering the line, and mark the point of disappearance (where the line just touches the water). Lower the disk a few more inches below the point of disappearance. Raise the disk until light can just be seen reflecting upward from the white surface of the disk and mark the point of reappearance. See the detailed technique document for the best way to do this.

10. The average between these two points (the point of disappearance and the point of reappearance) is taken as the Secchi Disk transparency. Record the disappearance and reappearance depths and/or the average transparency on the data sheet.

11. One or more people on board should repeat this procedure and data should be recorded for all observers. If you are alone, record your data, then do it a second time.

12. If you feel like it, after doing the shaded side, you can repeat the same measurements on the sunny side of the boat. This will provide data on how much the readings differ, especially under different sky and wave conditions. If you don't feel like it, don't worry about it.

13. After all Secchi measurements are complete, measure the **water depth** with your Secchi gear and record it on your datasheet.

NOTE: While the reports you have seen give Secchi depths in meters, you are not expected to measure anything in the metric system, although that would certainly be fine. I expect all submitted data will be in feet and inches. Please note what units you use, to avoid ambiguity.

After you get back home, please double-check that your datasheet is complete and readable, then you can scan it or take a readable photo of it and email it to province-lake-water@cox.net. Or you can hand deliver or mail me the sheet. Email me for details if you don't already know where to find me.

Thanks!
Norm

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