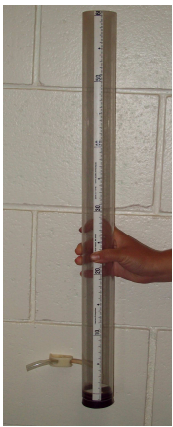


Transparency-Tube and Rain Gauge Data Volunteer Fact Sheet

Brown cloudy water and a river listed as “impaired.” The Nemadji River and Deer Creek were listed on the Federal list of impaired waters due to turbidity. Turbidity is cloudiness of the water, and in this case, it is caused by suspended sediment in the water. Sediment degrades the quality of the spawning habitat and turbidity can affect fish feeding success. Additionally, high sediment loads from the Nemadji River have also been a major contributor to sediment buildup in the Superior Harbor.

In response to the impaired waters listing, the Carlton County SWCD in collaboration with the Minnesota Pollution Control Agency is conducting a Total Maximum Daily Load (TMDL) study to learn about the sediment sources and find ways to reduce them. [Data collected by volunteers will be important during this project!](#) [Monitoring is a great way to learn about the river and helps move toward sediment reduction strategies.](#)



[Transparency-tubes](#) measure water clarity in these four easy steps:

- 1) **Fill tube.** A 60cm or 100cm clear tube is filled with stream water.
- 2) **Release water.** Water is slowly released out of a valve at the end of the tube while looking down into the tube.
- 3) **Stop release.** Once the symbol at the bottom of the tube is visible through the water, the water release is stopped.
- 4) **Record reading.** A water clarity measurement is then taken by recording the number of centimeters of water left in the tube.

Lower number of centimeters reflects lower water clarity, often caused by high amounts of sediment. Transparency-tube information collected by volunteers can provide crucial information about under-researched segments of the river or tributaries and help pinpoint some of the possible sediment source areas. Additionally, high water clarity areas can be identified, aiding in the elimination of possible sediment source areas.



[Rain gauge](#) data is taken by observing rainfall amounts in a provided gauge. Rain gauge data is critical for calculating river flow and runoff amounts. Runoff is often the primary carrier of sediment. A good distribution of rain gages also aids capturing critical information about varying rainfall amounts in a watershed during the same rain event.

Frequently asked questions:

[Q: How often do I monitor?](#)

A: Volunteers are encouraged to take transparency tube readings weekly, beginning in April and ending in October. Additional storm events are also important to capture about once a month. Rain gage readings are taken on a daily basis.

[Q: Who will assist the volunteers?](#)

A: Minnesota Waters will provide a free one-day workshop. Volunteers will be given materials, training and guidance that day. Carlton SWCD staff will be available on an ongoing basis to assist monitors as questions arise and collect completed data forms.

[Q: Where do I monitor?](#)

A: Monitoring sites are chosen according to the accessibility of the site, feasibility to reach the site once per week, and the watershed areas with the most need for data. Final monitoring sites are established during the workshop after discussion with volunteers.

For more information, please contact Kirstin Swenson, Carlton County SWCD (218) 384-3891.