

Monitoring Stream Flow

Equipment needed

pencils

clipboard

"flow" data sheet

tape measure (50 feet)

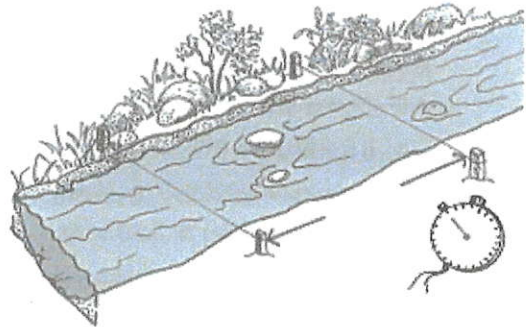
markers (string, stakes)

visible float (orange, stick, rubber ducky or whatever works. Oranges work well because they float partially submerged in the water, they are fairly water-proof, less subject to wind resistance and you can eat them when you are done.)

stopwatch

calculator

waterproof boots/waders



Velocity is a measure of length (or distance)/time

While the float method (floating an orange down the stream) serves more as an estimation of flow, it is a tried and true method.

Where?

You will need a section of your stream reach that is as straight and uniform in width as possible (channelized sections of streams work well for this exercise). The section you choose should also be shallow enough for you to wade across safely. Make sure that you come back to the same place every time you measure flow.

How?

Velocity

You will need at least two people, and best three, for this exercise.

Measure the length (distance) of the stream section you have chosen for your flow measurement and record it on the Data Sheet. Mark the start and finish lines in some manner. (A tape measure of string held across the stream works well).

Person #1 wades in the stream at the upstream starting line, float in hand. Person #2 wades in the stream at the downstream finish line. Person #3, if available, stands on the bank next to the finish line, stopwatch and clipboard in hand. If you have only 2 people, the one at the finish line holds the stopwatch.

Person #1 drops the float on the surface, upstream from the starting line. As the float passes the starting line, person #1 yells "go" and person #2 starts the stopwatch.

When the float crosses the finish line, person #2 stops the stopwatch, catches the float, and records the time, or gets person #3 to help out.

Discard any trials in which the float gets caught in debris, rocks or eddies.

On the Data Sheet, record the time in seconds that it took for the float to travel the measured distance.

Because the velocity of the water varies across the width of the stream, you need to repeat this process several times, sending the float down different flow paths. We recommend ten float trials to get a velocity measurement representative of your stream.

Record all the time values. Calculate the average float time by dividing the sum of the time values by the number of float trials.

To calculate the average velocity, divide the distance value by the average float time value. Your result is the average surface velocity.

Because the velocity of a stream varies from the surface to the bottom, adjust your result to reflect the overall average velocity of the stream. (Thomas Dunne and Luna Leopold, internationally recognized hydrologists and authors of *Water in Environmental Planning*, use a correction factor of 0.8 when calculating flows with the float method.) The adjusted value is called the corrected average velocity.

Efforts	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10 th	Average Mean
Seconds											

Velocity : length (or distance)/time= ____ m/sec