Stream Flow

Peggy: Stream flow is a measure of the amount of water flowing past a certain point in a set period of time. It's often measured in cubic feet per second (cfs) or a number of these, a cubic foot, flowing past a point in a second. Here to tell you more about stream flow is Christopher Wright, aquatic biologist at the University of Wisconsin-Platteville.

(0:20) *Kristopher*: There are many different sizes of streams and watersheds throughout Wisconsin: from small headwater streams to rivers like the Wisconsin and Mississippi. A streams velocity and volume will influence the physical habitat and organisms within that stream.

(0:40) In order to monitor stream flow, you will need: a tape measure, yard stick or marked pole for measuring depth, flags or marking tape, a float (such as a tennis ball), a net to catch the float, a stopwatch, calculator, recording form, pencil, and hip boots. Optional items may include: string and stakes. In addition, we recommend bringing along an extra person to help out with measuring flow.

(1:11) The first step when measuring flow is to decide on the area you're going to make your measurements within your 300' site. Ideal locations are those without meanders or multiple channels that are relatively straight and that have approximately the same width over a twenty foot length.

(1:35) You'll need four measurements for flow: length, width, depth, and velocity. To measure the length of your study area, take the tape measure and mark off the upper or lower point of your study site. Measure up or down ten feet and mark that location. Then, finish with twenty feet with a final marker. Record the length of your site in your data sheet in section 1.

(2:33) To measure width, go to the middle mark flag and measure the width from wetted bank to wetted bank. Pull the tape tight and record the measurement in your data sheet. Measuring depth will occur at the same location. You'll want to tie off your tape measure either on a small tree or a clump of grass. Have your helper hold the other end across the stream. An alternative method is to use two stakes and tie off a string between the stakes and mark one foot intervals using clothes pins or some other markers.

(3:20) Depth will be measured either with a yard stick or a pole that's been marked for measuring. To help speed calculations up later on, the marked pole may be delineated in tenths of feet. When using a measuring stick or your pole, we'll take measurements at one foot intervals along the width of the stream. You'll notice in your data sheet that the first row is already filled in with zeroes. This is to compensate for the edge habitat that exists within your site.

(3:58) Measurements of depth at each foot are done at the water surface. In slower areas, the water will remain level and just record the measurement at the water surface. As you move into deeper and faster water, you'll begin to notice a difference between the water level at the front of your meter stick versus the water level at the back of your meter stick. For your measurement, you'll want to approximate the middle water level between the front and the back. Continue measuring your depth measurements at

one foot intervals until you've reached the far side. In case your site is wider than twenty feet, you'll want to divide the width by twenty and use that new calculation as your interval across the stream.

(5:02) The final step is to measure velocity. To measure velocity, we're going to measure how long it takes for your float to get from the top of your twenty foot area to the bottom of your twenty foot site. To get a good representation of the different velocities within your stream channel, we'll take measurements at four different locations along the width of the channel. If your channel happens to be less than ten feet wide, you'll only need three measurements.

(5:38) Measurement of velocity starts above your uppermost flag. If you're using a tennis ball for your float, you may want to cut a hole into it and put some water in to make it more neutrally buoyant. Drop the float into the water and allow it to get to speed and signal to the downstream person when to start the stopwatch. At the downstream marker, be sure to stop the stopwatch as the tennis ball reaches the marker and scoop it up with your net. Again, repeat this measurement three other times at different locations within the width of your channel.

(6:27) Be sure to record the measurement from each trial in your data sheet. If by chance your float gets stuck or snagged along the way, redo that trial.

(6:40) To summarize, to measure flow you'll need:
-Width measurement
-Depth measurement
-Measurement of velocity
-Calculate flow or discharge

(6:52) *Peggy*: Knowing and understanding the flow of a stream over time can help interpret other monitoring data. For instance, increased stream flow from heavy rain or snow melt might result in a sharp increase in turbidity due to the sediments and other particles entering the stream. With a past and current measurement of stream flow, the increased turbidity is easily explained. If you would like to know more about stream flow, view the stream ecology section of this DVD series.