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**ASSIGN
BUSTER**

Determination of velocity and discharge using floats Theory

If a flow

meter is not available or a rough estimate is adequate you can measure flow by using a float. The float can be any buoyant object such as an orange or a partially filled plastic water bottle. It needs to be heavy enough so that about an inch of it is below the water line. Measure off at least 50 feet along the bank of a straight section of stream if possible string a rope across each end of the 50-foot length. Discharge: The amount of water passing a point on the stream channel during a given time is a function of velocity and cross-sectional area of the flowing water. $Q =$

AV where Q is stream discharge (volume/time), A is cross-sectional area, and V is flow velocity. Velocity: The process involved in the float method of measuring velocity is by observing the time for a floating body to traverse a known length and noting its position in the channel. The floating body may be a specially designed surface float, subsurface float, or any selected piece of drift floating with the current.

$V = d/t$ 1. Estimate cross-section area stream one of these ends using total stream width and average depth. $\text{Total width (feet)} \times \text{Average depth (feet)} = \text{area (ft}^2\text{)}$ 2.

Free the float at the upstream site. Using a stopwatch record the time it takes to reach the downstream tape (if the float moves too fast for correct measurement measure off 75 or 100 feet instead of 50) restate the measurement two more times for a total of three measurements. 3. Calculate the velocity as distance traveled divided by the average amount of time it took the float to travel the distance roped off is 50 feet and the orange took an average of 100 seconds to get there the velocity is 0.5 ft/sec

50 f = 0.5ft/sec 100sec 4: Correct for the surface versus mid-depth velocity by multiplying the surface velocity by 0.

85. $0.5 \times 0.85 = 0.43 \text{ft/sec}$ 5: Calculate the discharge in cubic feet per second (cfs) by multiplying velocity (ft/sec) by the cross-sectional area (ft²) of the stream. 0.43ft/sec x 10.73 ft² = 4.

62 cfs Using of staff gauge A staff gage is nothing more than a long ruler placed semi-permanently in a stream or lake and used to find water depth. Stream gages are the most general and helpful measure and are therefore emphasized here. However, you also can put a staff gage in a lake to monitor changes in lake water level.