

Current meters must be calibrated before being used to measure point velocities. The calibration is made by counting the number of revolutions made for a given interval of time for several known velocities. The revolutions per unit of time are then graphed versus the known velocities. From the resulting curve, velocities are obtained when revolutions per minute are measured in the field.

For wide streams the channel cross section is divided into segments (Figure 3) and point velocities are taken in the vertical direction at the horizontal midpoints of the segments. The mean velocity of a segment multiplied by the cross-sectional area of the segment is the flow rate for that segment. As in the example in Table 2, adding the flow rates for all segments gives the total flow rate of the stream shown in Figure 3.

In Figure 3, two methods are shown for using a current meter to determine the mean velocity of a channel segment. These are the single-point and two-point methods. In the two-point method, point velocities are obtained at 0.2 and 0.8 of the depth. The average of the two values is used as a mean velocity for that segment of the channel. The single-point method is generally used for shallow flow depths (less than one foot), and the reading is taken at 0.6 of the depth.

The channel section where current meter measurements are taken should be straight with an approximately uniform cross section. Obstructions in the channel, such as bridge piers, should be avoided because of additional turbulence in the stream flow.

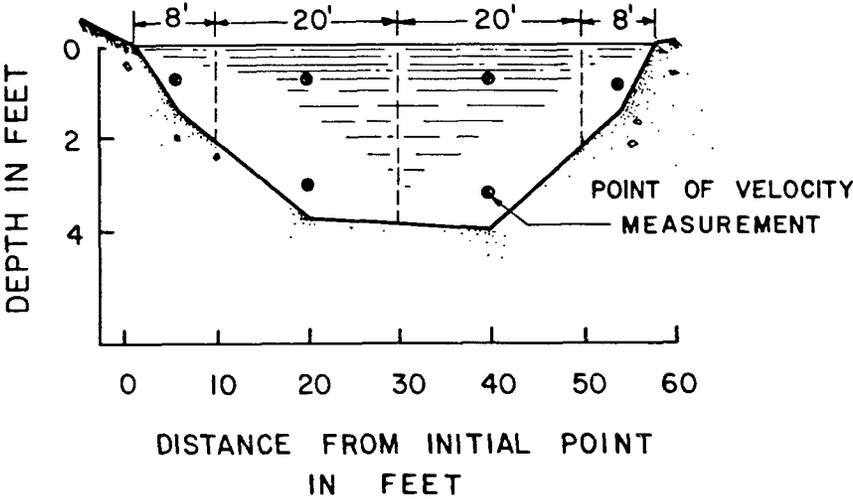


Figure 3. Subdivision of stream cross section for current meter flow-rate measurements.