



## TEXAS STREAM TEAM ADVANCED FIELD GUIDE – STREAMFLOW ESTIMATE

### Equipment Needed:

- Yard or meterstick (make sure it has standard units on at least 1 side)
- Timer such as a stopwatch, cell phone or wristwatch with timer capability.
- Whiffle Ball or other floating object such as a rubber duck, stick, leaf, etc.
- 1 tape measure (2 if monitoring alone)
- Water shoes/sandals or waders.

### Before Heading Out

Check if your monitoring site is within 0.25 mile of a stream gauge. You can check the [United States Geological Society](#), [International Boundary and Water Commission's](#), or your local river authority to see a list of flow gauging stations. Measure the distance from your monitoring station using free software such as Google Earth, implementing the measurement tool. If your monitoring site is within 0.25 miles downstream of a gauge, record the gauge reading from the approximate time you conducted your monitoring event. Record the flow value and method on your monitoring form. If the nearest gauge is >0.25 miles upstream of your monitoring site, proceed with the method below to estimate streamflow.

### Safety Notice

Never measure streamflow in swiftly moving or deep water, or in hazardous weather conditions. Take a buddy with you for safety purposes if possible. If you are concerned for your safety, do not conduct streamflow monitoring.

### Procedures

1. Select a cross section of the waterbody to measure, avoiding pools, ripples, backflows, etc., that would impact the waterbody's true flow. Choose a section between 5 – 20 feet wide if possible.
2. Measure the width of the waterbody in feet. Measure only the water from the edge of the left bank to the edge of the right bank. Round to the nearest 1/4<sup>th</sup> inch.
3. Measure the depth of the water body at the midpoint of the 2 feet wide increments. Average the depth measurements and notate on your monitoring form.
4. Measure 10 feet downstream (following the current) at the centroid of flow. If measuring with a buddy continue with step 5. If measuring alone, skip to step 6 for specific instructions.
5. Have one person stand upstream (at the beginning of the 10-foot measurement), and the other downstream.
  - a. The person upstream drops the whiffle ball or another floating object into the current.
  - b. The person waiting downstream times how long it takes the object to travel 10 feet using the timer, then retrieves and returns the object to the starting point.
  - c. Record the time on the monitoring form. Repeat the process 3 times and average the recorded times.
6. (Sampling alone only) Use the second tape measure to measure 10 feet downstream from the centroid of flow. Instead of a whiffle ball or other plastic floating device, use a dry stick or something from your natural surroundings that can float to prevent littering.
  - a. Mark where the 10-foot measurement is downstream from the centroid. You can place a stick into the bed so that it is visible above the water surface, or stack rocks. Be sure to take down any rock stacks after completing the measurement.
  - b. Standing upstream (at the beginning of the 10-foot measurement), drop your floating object into the current.
  - c. Use the timer to time how long it takes the object to travel 10 feet.
  - d. Record the time on the monitoring form. Repeat the process 3 times and average the recorded times.
7. Divide the distance (10 ft) by the average time to calculate the average velocity.
  - a. Average Velocity (ft/sec) = 10 (ft) ÷ Average Time (sec).
8. Calculate and record the discharge in cubic feet per second (cfs).
  - a. Discharge (cfs) = Width of Waterbody (ft) x Average Depth (ft) x Average Velocity (ft/sec).