Flow Measurement

SWQM Procedures, Volume 1

Chapter 3
What to Do?

Estimate?

Or Measure?
Why Must I Measure Flow?

Required for All Freshwater Routine Sites

Needed for Assessment Purposes

Used in TMDL, 7Q2, and other Agency Purposes
What Do I Need to Report?

Flow Severity

Flow Measurement Method

Flow (cfs)
Flow Severity

- 1 = No Flow
- 2 = Low
- 3 = Normal
- 4 = Flood
- 5 = High
- 6 = Dry
No Flow – Flow Severity 1
Low Flow – Flow Severity 2
Normal Flow – Flow Severity 3
Flood – Flow Severity 4
High Flow – Flow Severity 5
Dry– Flow Severity 6
Flow Measurement Method

- 1 = Gauge
- 2 = Electronic
- 3 = Mechanical
- 4 = Weir/Flume
- 5 = Doppler
Flow (cfs)

- Instantaneous flow value, either measured in field or reported from gauging station
When Do I Measure Flow?

Freshwater Routine Sampling

24-hour DO deployments

ALM, RWA, UAA, ALA

When it is SAFE to do so
Where Do I Measure Flow?

- Straight Reach
- Laminar Flow
- Even streambed free of obstructions
- Avoid areas with back eddies if possible
How Do I Measure Flow?
Getting Ready to Measure Flow

Set up the tagline perpendicular to the main flow

Make any modifications to the stream BEFORE any measurement begins

Determine the number of cross sections needed

Determine the midpoint of the cross section

Stand downstream of the sensor and to the side
Measuring Flow

Measure Cross Section Depth and velocity at each midpoint

<=2.5 ft, one velocity measurement at 60% of the depth

> 2.5 ft, two velocity measurements at 20% and 80% of the depth are averaged

Measure velocity for 20-40 seconds at each cross section midpoint.
Measuring flow at the midpoint
How Many Cross Sections?

- **Width < 5 ft**
  - Cross section every 0.5 ft

- **Width is between 5 and 10 ft**
  - 10 cross sections

- **Width is greater than 10 ft**
  - Prefer 20-30 cross sections

No more than 10% of the flow in any one cross section
Reporting Flow Results

- **Flow is < 0.01**: Report as < 0.01
- **Flow is between 0.01 and 10**: Report to nearest tenth
- **Flow is > 10**: Report to nearest whole number
- **No Flow**: Report as 0
- **No Water**: Do not report
Kiss My Grits!!!