

Flowmeters

Variability & Suggested Practices

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Monitoring studies in the San Francisco Bay-Delta region rely on flowmeters to track water volume sampled and estimate catch per unit effort (CPUE). Flowmeters measure volume using an impeller attached to a counter which turns at a rotor constant rate (k). This rate determines the conversion of flowmeter counts (M) to water volume. CPUE estimates are reliant on the accuracy and reliability of flowmeters. Improper use, care and calibration will lead to poor data quality **Recommended Best Practices for flowmeters:** Calculating water volume (V, m³)

Flowmeters should be regularly tested (by Calibration Frame) and

calibrated annually (using a flume) to monitor changes to the rotor constant (k).

A General Oceanics Checker for flowmeter rotor spin resistance.

- Flowmeters should be refurbished or replaced when k no longer meets factory specifications or when there is a noticeable increase in rotor resistance when rotated manually.
- Flowmeters should have a standard, and regular upkeep following each sample period (i.e. rinsing with fresh and DI water).
- Surveys should investigate potential variation in flowmeter counts such as changes in counts over time, differences among individual flowmeters, or among flowmeter brands.

constant rate (k) and net mouth area (A, m²)

from flowmeter counts (M), rotor

 $V = \Delta M \times k \times A$

Scan here to participate in a flowmeter survey and contact the authors for additional information.



What do we know about Flowmeter variability?

Within a Summer Townet season (2019), there were no measurable trends (Fig. A) in individual flowmeter cumulative counts (i.e. total use of a flowmeter over time) and the regularly recorded flowmeter counts at each tow. However plenty of variation was present within each individual flowmeter. However, across survey seasons (2003-



negative relationship (p=0.01) between average flowmeter readings and **cumulative flowmeter counts** of individual meters.

2019) a linear model found a significant,

Among 2 Brands (Fig B. General Oceanics, and Ocean Test Equipment) we found no significant differences, but different degrees of variation.

