

## Spatial variability of fines affects results from various grid-count sampling schemes

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**Abstract.** The status and trend of aquatic ecosystems in mountain streams as well as changes in the supply of fines are monitored by measuring the percentage of fine sediment  $< 2$  and  $< 6$  mm in pool-tail areas. Grid counts taken at 25, 50, and 50% of the wetted pool-tail width ( $w_{wet}$ ) are typically employed for this task. However, a high degree of variability among streams and operators, as well as among crews performing nearly identical procedures is reported. This study examined how spatial variability of fines within pool-tail areas affects grid-count results and explored whether some grid-count schemes provide results that are more accurate and less variable than others. Grid counts were taken at 7 locations across  $w_{wet}$  and indicated a fining trend towards one or both pool-tail banks, sometimes interrupted by a secondary peak of fines within the central half of  $w_{wet}$ . From the 7 sampled locations, 5 different grid-count schemes were derived, each of which covered a different percentage of the stream width and required a different work effort. Each sampling scheme indicated a different percentage of fines as well as a different degree of variability between two adjacently transects, between two operators, and among the pools over the reach. Sampling schemes likewise differed in their accuracy. When strengths and weaknesses among schemes were weighed, the scheme that covered  $w_{wet}$  with 7 even-spaced locations combined high accuracy and good lateral coverage with moderate variability and was rated the overall best. The other schemes had desirable results only in either coverage, work effort, variability, or accuracy. Accuracy and precision obtained from the commonly used grid-count scheme that samples at 25, 50, and 75%  $w_{wet}$  can be greatly improved by sampling 7 even-spaced locations across the pool-tail width.

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