

Field tools for improving the accuracy of pebble counts in wadable coarse gravel-bed streams

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Abstract. Particle size-distributions derived from pebble counts need to be accurate in order to provide useful parameters for stream studies. However, operators can easily introduce errors into pebble counts if particle selection is not free of subjectivity and serial correlation, and if the particle sizes are not measured accurately. Errors in particle-size measurements can be minimized by using a gravel template. Operator influence on particle selection can be minimized by using a sampling frame, 60 by 60 cm, in which sampling points are identified by the cross points of thin elastic bands. The spacing between the cross points is adjustable and a setting equal to the dominant large particle size ($\approx D_{95}$) avoids serial correlation between counted particles. In a field test in a coarse gravel-bed river, the sampling frame developed in this study produced coarser size-distributions, particularly in the cobble range, than the traditional heel-to-toe walk that selects particles with a blind touch at the tip of the boot (Wolman 1954) and reduced the difference in sampling results between two operators. The difference between the methods is attributed to an unbiased selection of coarse particles when using the sampling frame.