

Fine sediment in pool-tail areas measured with pebble counts, grid counts, and armor samples

Kristin Bunte¹, Steven R. Abt, John P. Potyondy, Kurt W. Swingle
Department of Civil and Environmental Engineering, Colorado State University

Abstract. The study compared percentages of fines < 2 and < 6 mm measured in pool-tail areas of a coarse mountain stream by grid counts, pebble counts, and volumetric armor samples. Due to bankward fining, pebble counts spanning the wetted width w_{wet} indicated 2-3 times more fines than grid counts that represented the central 50% w_{wet} and excluded the relatively fine-rich waterline areas. However, when both were limited to within the central 50% of w_{wet} , grid counts indicated 1.2 and 1.6 times more fines < 2 and < 6 mm than pebble counts, probably because a plexiglass viewer used with grid counts improved the visibility and identification of fine particles.

The percent armor fines increased with the depth of sample excavation and with the level of truncation at the coarse end. The ratio of armor- to grid-count fines was not constant, but changed depending on how fine-rich a bed was: armor fines exceeded grid-count fines by 1.7 times in the pool with the least amount of fines but were only 0.6 times the percentage of grid fines in the most fine-rich pool. Armor fines were less variable within and among pool tails than grid-count fines taken at the same locations. Results suggest that grid counts reflect the spatial variability of fines, while armor samples provide spatially more integrated results. The degree of similarity between armor- and grid-count fines collected at the same locations is highly affected by the details of the armor sampling technique as well as by the richness and spatial variability of fines in the bed.

¹ Engineering Research Center
Department of Civil and Environmental Engineering
Colorado State University
Fort Collins, CO 80523-1372
Tel: (970) 491-3980
e-mail: kbunte@engr.colostate.edu