



## **Coarse particulate organic matter transport and particle-size distribution in two mountain streams**

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The computation of coarse particulate organic material (CPOM) export from mountain streams with basin areas larger than a few ha in size is typically conducted using a rating curve approach in which a relationship is established between short-term measured CPOM transport rates or concentrations and stream flow  $Q$  ( $CPOM = f(Q)$ ) that is applied to the hydrograph of a storm event or the highflow season to compute an event or seasonal CPOM load. In analogy to temporal variability that is commonly observed in bedload or suspended sediment transport, CPOM transport is likewise affected by an interplay between flow hydraulics as well as temporal and spatial variations in off-stream and in-stream supply. Consequently, rating relationships of  $CPOM = f(Q)$  may be expected to be variable between events and within a highflow season as well. With respect to particle sizes of organic material, fine particulate organics  $< 1$  mm (FPOM) have typically been found to contribute more to total export than CPOM, but it is unknown whether this trend extends to pieces of wood as well.

This study is based on CPOM pieces  $> 4$  mm and  $>$  larger 10 mm contained in large bedload samples collected in two mountain streams, one at a high elevation with a snowmelt regime in the United States Rocky Mountains, one at a moderate elevation and mainly rainfall regime in the Swiss Pre-Alps. The study shows that transport rates of CPOM are subject to hysteresis over a snowmelt highflow season. Hence, seasonal CPOM load computed from a summation approach differed from the CPOM load computed using rating curve approaches by factors ranging from 0.5 to 4.5, depending on whether CPOM samples were collected during a rising or a falling limb of the dual peak seasonal hydrograph. Our study results indicate that collection of time-series CPOM samples and application of a summation approach are desirable to compute seasonal CPOM loads. Frequency distributions of CPOM piece sizes collected over different storm events in the high energy Swiss torrent showed that small pieces were always more frequent than large pieces regardless of storm magnitude. Hence in all events, small pieces contributed larger amounts to the event CPOM load than large pieces. This finding suggests that the frequently observed trend in which fine POM contributes more to seasonal or annual load than coarse POM extends to very coarse POM (chunky wood pieces) as well.