

Coarse particulate organic matter transport in two Rocky Mountain streams

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Abstract. Transport of coarse particulate organic material (CPOM) is one form of watershed carbon export. In basin areas larger than a few ha in size, CPOM export is typically computed from short-term samples, based on a relationship that is established between measured CPOM transport rates or concentrations and stream flow Q (CPOM = $f(Q)$). The resulting rating curve is then applied to a hydrograph of a storm event or the highflow season to compute an event or seasonal CPOM load.

This study is based on intensive sampling of CPOM > 4 mm in two high elevation Rocky Mountain streams. Samples were collected in bedload traps that facilitate hour-long sampling times and sample volumes of up to 20 liters. CPOM transport rates were subject to pronounced daily and seasonal hysteresis, reflecting the effects of flow hydraulics as well as temporal and spatial variations in off-stream and in-stream supply. Consequently, rating relationships of CPOM = $f(Q)$ changed within the highflow season.

The time series data allowed seasonal CPOM loads to be summed from short-term loads (summation approach), and the computations served as approximation of true loads against which results from various rating curves were compared. In both study streams, 90% of the annual CPOM load occurred in the one-month central part of the snowmelt highflow season. Hence for accurate quantification of annual CPOM loads, sampling needs to be focused on the highflow period, and be intensive. Intensive, time-series sampling and application of a summation approach are desirable to compute CPOM loads.

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