

2003 Seattle Annual Meeting (November 2–5, 2003)

Paper No. 13-6**Presentation Time:** 9:20 AM-9:35 AM**STREAM, HYPORHEIC, AND HILLSLOPE FLOW INTERACTIONS
ALONG A HEADWATER CHANNEL**

GOMI, T., Geography, The Univ of British Columbia, 1984 West Mall, Vancouver, BC V6T 1Z2, Canada, gomi@interchange.ubc.ca and **MOORE, R.D.**, Geography and Forest Resources Management, The Univ of British Columbia, 1984 West Mall, Vancouver, BC V6T 1Z2

Hyporheic exchange is an important control on solute transport and transformation in riparian-stream corridors, and it can also influence stream temperature. We examined interactions between stream, hyporheic, and lateral hillslope inflow based on the constant rate injection of a conservative solute (NaCl) during base flow periods in three reaches (upper, transitional, and lower) along a headwater channel in the UBC Malcolm Knapp Research Forest in coastal British Columbia. Transient storage and lateral inflow were estimated using the OTIS-P computer code, and piezometers were used to quantify vertical hydraulic gradients and to sample tracer movement through the hyporheic zone.

Lateral hillslope inflow appeared to occur at discrete locations rather than as dispersed input along channel reaches. The interactions among stream, hyporheic and hillslope flows appeared to be controlled dominantly by the channel steps, which produced vertical exchange across the bed, as well as by the gradients of adjacent hillslopes and the width and gradient of the riparian zone. The structure of the stream-riparian flow system varied with the height of the riparian water table, which influenced the lateral hydraulic gradients and hence the opportunity for lateral hyporheic flows. It also influenced, to a lesser extent, the pattern of vertical water exchanges across the stream bed.

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