Estimates of hyporheic flow effects on river water quality

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Abstract. River water movement into and out of hyporheic flow paths may have important effects on river water quality. In 1998 and 1999, we identified transient storage and hyporheic flow along 1-5 km reaches of a 30 km section of Oregon’s Willamette River. Detailed investigations at six sites showed that changes in hyporheic water quality depend on substrate type and hyporheic flow rate. We used vegetation cover along a 90 km river section as a surrogate for substrate porosity. We estimated hyporheic flow effects on river water quality using site-scale hyporheic water quality relationships with reach-scale transient storage estimates. We estimate that hyporheic flow provides 60% of increased river specific conductance and 1.5 degrees C of river cooling. Scaling up hyporheic water quality functions from small sites to long river sections remains the greatest challenge for increasing confidence in estimates of hyporheic effects on river water quality.