sedimenttransport Readme

To measure estimate the degree to which suspended load and carbon export were related to fish bioturbation, we collected bulk water samples (approximately 10 L) every 3 h for 24 h from one site on two dates (stationary antenna reach, 2010). Turbidity was recorded every five minutes within the stationary antenna reach during the 2010 season using a self-cleaning turbidity probe (YSI 6136) mounted on a sonde (YSI Environmental 6600 V1, Yellow Springs, OH) located within our stationary antenna array. We used the 2010 bulk water samples to relate turbidity values to suspended load and carbon export. Three replicate samples were filtered on pre-ashed filters (Type A/E, Pall-Gelman, Ann Arbor, Michigan, USA), immediately frozen, and processed using standard methods for ash-free dry mass (AFDM) (Wallace et al. 2006, Hutchens et al. 2017). We regressed average turbidity against our measured suspended load, and used the regression equations to estimate suspended load (DM mg/L=0.00277 + 0.00063\* Turbidity Rolling Average NTU; R2=0.55) and carbon export (AFDM mg/L=0.00073 + 0.12957\*DM mg/L; R2=0.60) for each turbidity record, multiplied by the discharge at that point. We used the average turbidity value for the hour prior to bulk sampling when developing regression equations to account for short-term turbidity spikes.

To link fish activity to turbidity measures, we used detections from the four antennas directly adjacent to the pool where our turbidity monitoring equipment was located, an approach similar to that subsequently employed by others (Cooper et al. 2016, Rice et al. 2016) to link cryptic activity of invasive crayfish to diel turbidity cycles. Fish activity was the number of unique individuals detected within the antenna array during the one- hour period prior to each turbidity record (5 min intervals). Individual fish were only tabulated once per rolling interval, and in this context, we treat activity as an index of the population of tagged fish entering or exiting the shallow foraging area. The spatial occurrence of antenna detections (Fig. 2) and visual observations of fish activity indicated that fish typically remained out in shallow water once they had left the refuge pool and passed the antenna array.

Column headers

Date\_time: data were collected at 5 minute intervals via sonde

Temp ('C): in °C via sonde

SpCond (mS/cm): in milliSiemens per cm via sonde

Gauge height (m): water level recorded adjacent to sonde installation to estimate discharge

Discharge (m3/s): discharge calculated from stage-discharge relationship estimated for study period

Turbidity (NTU): Raw turbidity value via sonde

Turbidity rolling average (NTU): smoothed turbidity values, rolling average over previous 1 hr

Fish Activity: unique tagged individuals detected within the study reach during the previous 1 hr

DM (g/s)-estimated: suspended sediment dry mass estimated via regression

DM packet (g/5min): unit conversion 1 s to 5 min intervals

AFDM (g/s)-estimated: suspended sediment ash free dry mass estimated via regression

AFDM packet (g/5min): unit conversion 1 s to 5 min intervals