

[Can macroinvertebrate biological traits indicate fine-grained sediment conditions in streams? \(Murphy et al. 2017\) \[1\]](#)

Excessive inputs of fine-grained sediment can damage aquatic ecosystems both by degrading habitat condition and by directly impairing biota. Recent research has improved our understanding of how benthic macroinvertebrates respond to fine-grained sediment stress, leading to the development of a variety of bioassessment indices based on changes in taxonomic composition and biological trait composition. Use of biological traits as indicators of stress has been advocated on the basis of a better mechanistic understanding of the biotic and abiotic factors acting on benthic communities. We quantified changes in the macroinvertebrate biological trait assemblage from a large number of river reaches spanning a national-scale gradient of increasing agricultural fine sediment delivery and retention, having first factored out variation associated with the natural environmental gradient, with the aim of robustly testing predictions of trait response.

We found strong support for 2 of 18 predictions of how macroinvertebrate traits would respond to fine sediment stress. Furthermore, using an independent dataset, we were able to confirm the response of 5 of 6 trait classes that partial RLQ-fourth corner analysis found to be significantly associated with the fine sediment gradient. Prevalence of eggs as a resistant form, in combination with either an adult aquatic life stage or crawling, provided the best indication of fine sediment conditions in streams, approaching the performance of taxonomic composition-based sediment indices, CoFSIsp and EPSImtl. This study has robustly confirmed the potential of macroinvertebrate biological traits as indicators of fine sediment impacts.

Publication Date:

Friday, 8 September 2017

Full reference:

Murphy, J. F., Jones, J. I., Arnold, A., Duerdoth, C. P., Pretty, J. L., Naden, P. S., Sear, D. A., Collins, A. L. (2017) Can macroinvertebrate biological traits indicate fine-grained sediment conditions in streams? River Research and Applications <http://dx.doi.org/10.1002/rra.3194> [2]

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