

On habitat complexity in streams derived from the analysis of tracer data

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Habitat complexity

Stream ecologists have shown that the habitat complexity of streams contributes to their biotic diversity and consequently their whole stream metabolism (Demars et al, 2011; Besemer et al, 2009; Besemer et al, 2013).

In this study we wanted to see how habitat complexity varied with stream size.

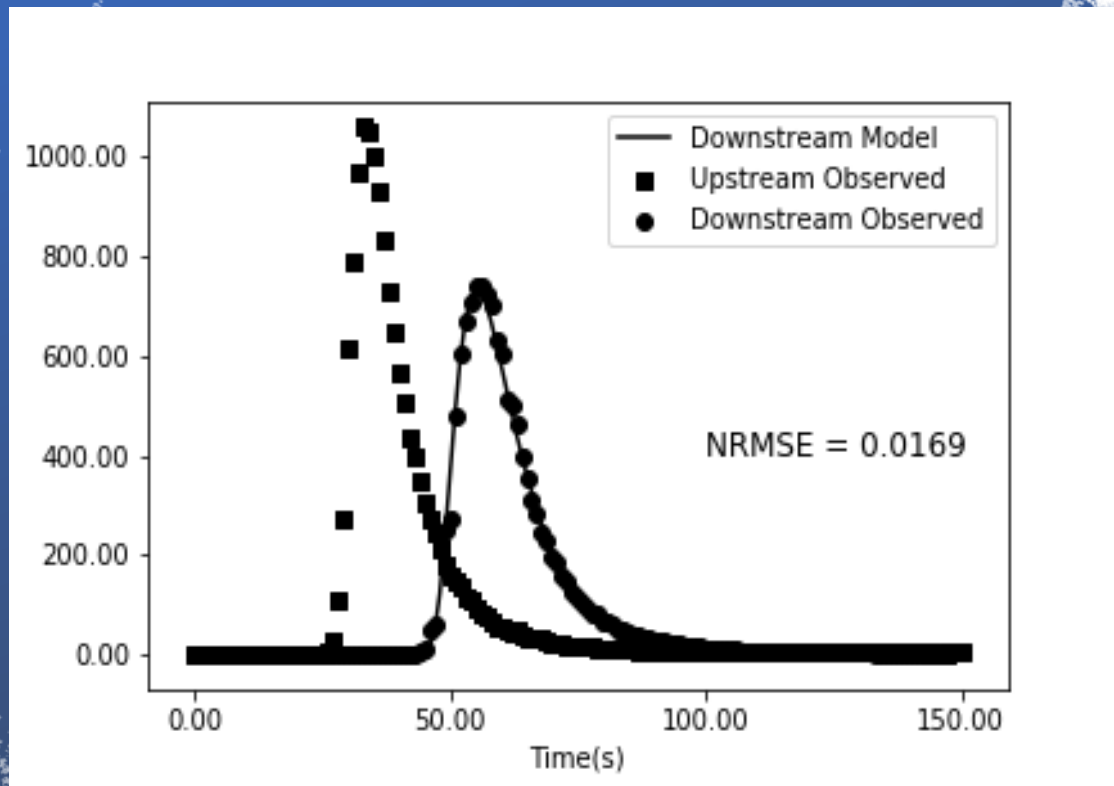


Some of the streams (51 in total)





Evaluating habitat complexity

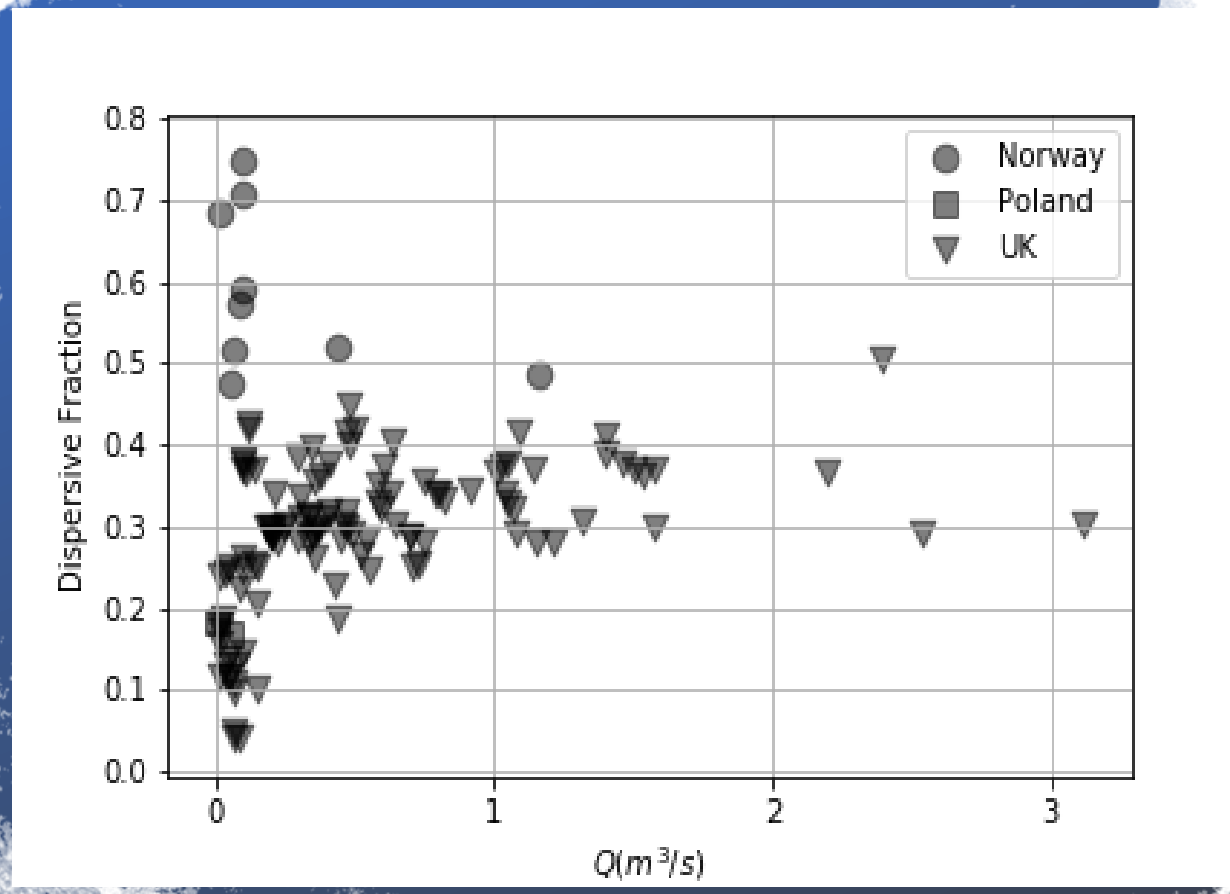


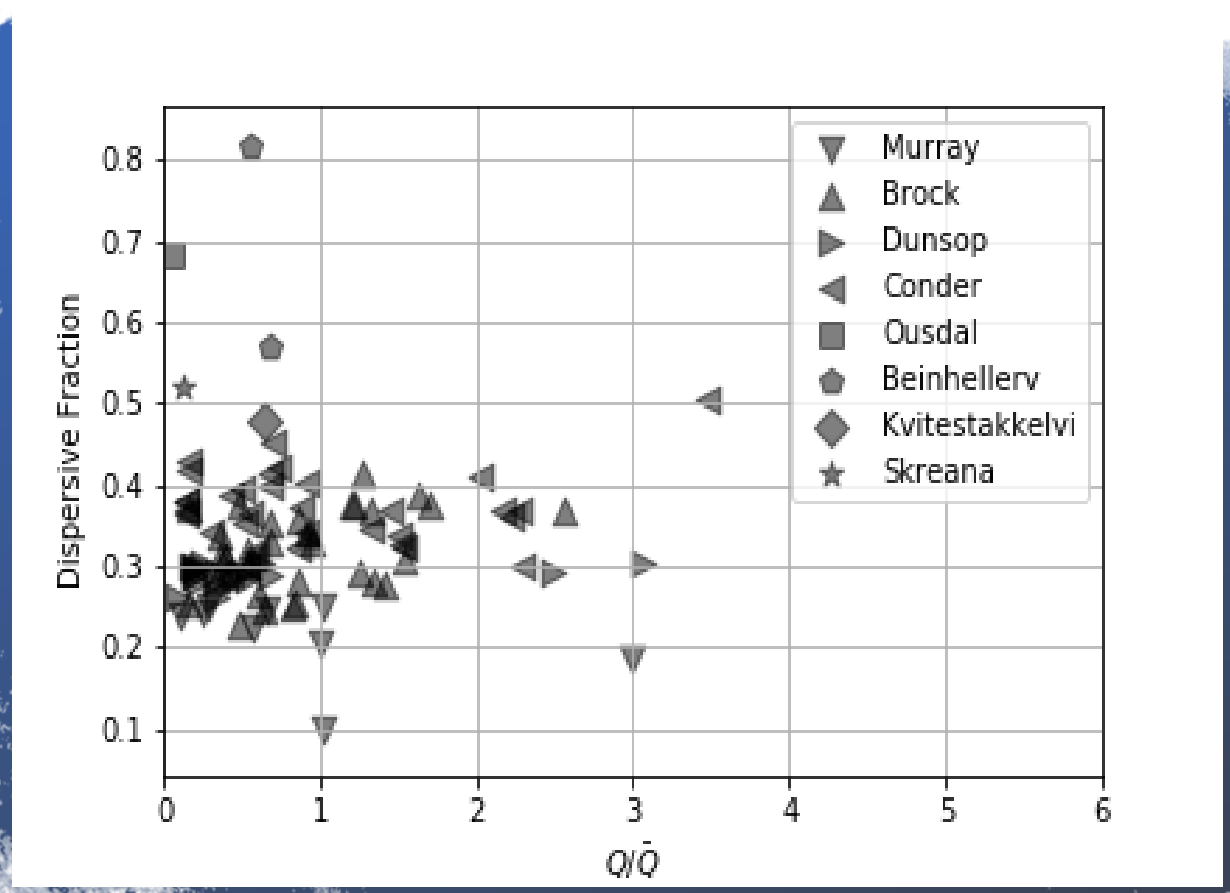
We chose to fit this simple model (aggregated dead zone model) to our tracer data believing that one of the model parameters (the dispersive fraction) would be an indicator of habitat complexity.

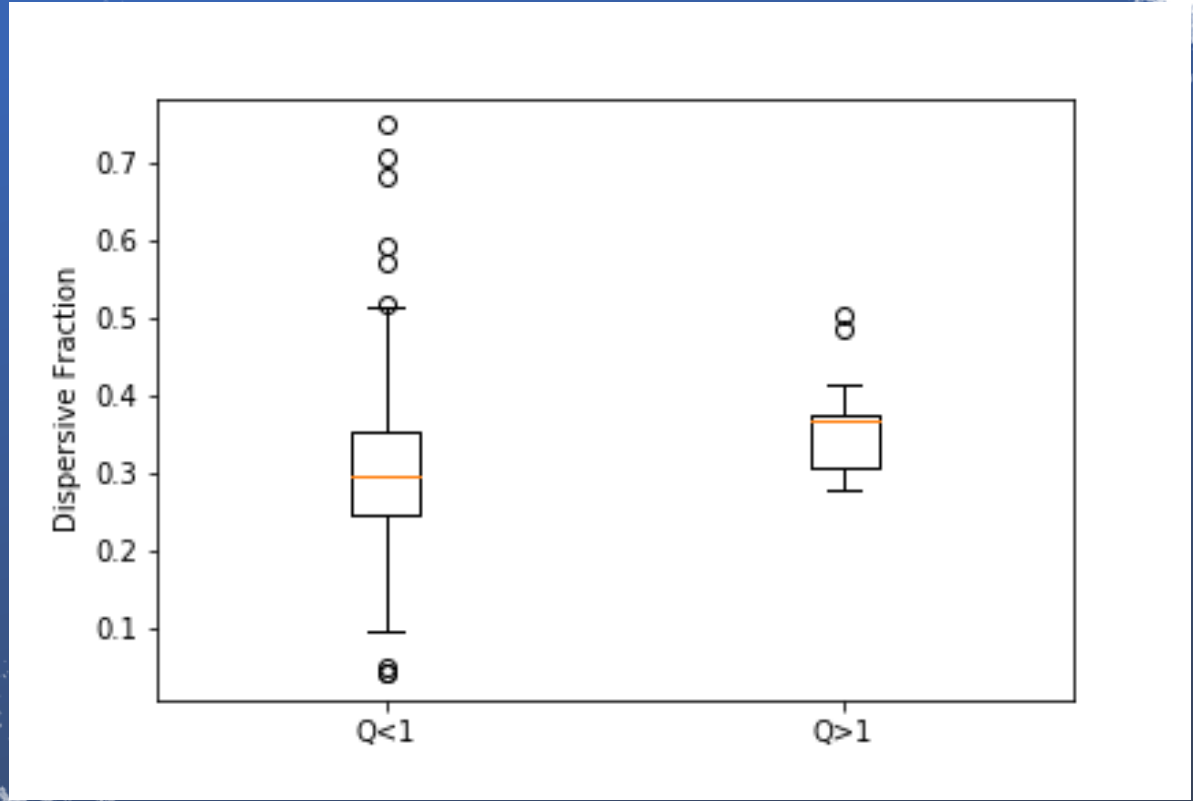
$$\frac{\partial c(t)}{\partial t} = \frac{1}{\bar{t} - \tau} [c_u(t - \tau) - c(t)]$$

Measure of goodness of fit

$$NRMSE = \frac{1}{\max(C_{OBS})} \left(\frac{SSR}{N} \right)^{0.5}$$









Conclusion

We posit that habitat complexity is more varied in smaller streams.

In larger streams physical features tend to be “drowned out” more.

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