CURRENT VELOCITY AND MACROINVERTEBRATE COMPOSITION

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Introduction

Global climate change will likely cause an increase of heavy precipitation events which lead to an increase of peak discharges. As a result the instability of the current velocity in streams increases. Do such disturbances influence aquatic fauna directly by dislocating animals from the streambed and indirectly by flushing out resources or shelters?

fig 1. Frederik - Bernhard stream where the experiment was conducted.

fig 2. Apparatus used to increase the current velocity in the experimental area.

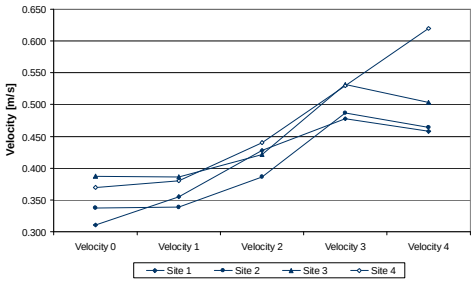

fig 3. Changes in current velocity at 4 sites.

Methods

The experiment was conducted at four sites in a Dutch lowland stream (fig 1). We exposed an experimental area of 0.25m^2 five times to a gradually doubling current velocity (fig 3), starting from the current stream velocity. Dislocated macro-invertebrates and sediment were collected with a drift net (fig 2). After the velocity peak, we sampled the exposed area for remaining macroinvertebrates.

Relation between current velocity and macroinvertebrate composition

An increasing velocity lead to an increase of allocated mineral material (fig 4). There was no crucial current velocity (threshold) by which macroinvertebrates started to be dislocated, but we have noticed that increase of current velocity caused an increase in amount of dislocated animals (fig 5).

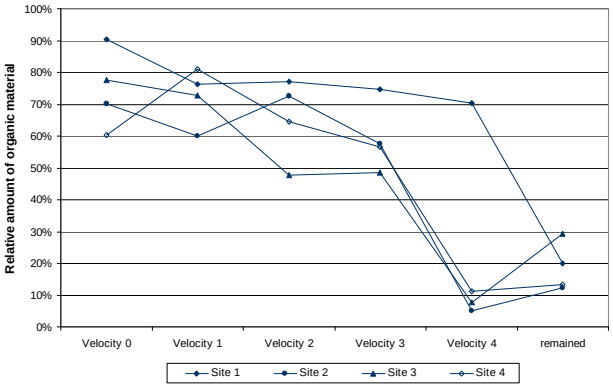

fig 4. Relative amount of organic material in sediment collected during the experiment.

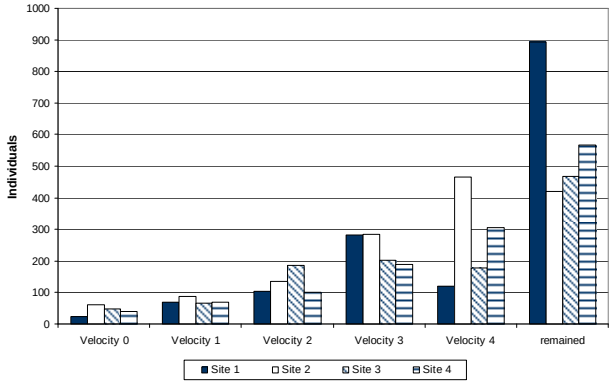

fig 5. Number of individuals collected at each velocity at the four sites

Conclusions

- Increase of current velocity causes dislocation of macroinvertebrates
- Higher current velocities lead to increasing sediment instability and increasing erosion of the stream bottom

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