

Seasonal Dynamics of a Northern Minnesota Stream

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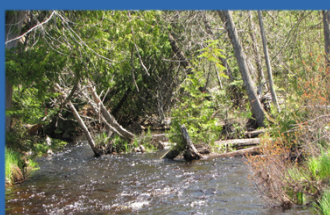
Faculty Mentors: Todd Wellnitz and Eric Merten



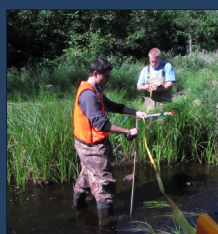
Background

How do seasonal changes in stream flow influence benthic stream algae? Algae are important because they are at the base of many stream food webs. We studied how three factors related to stream flow influenced algal abundance over a single summer. The three factors were:

- benthic temperature
- water depth
- water velocity



Methods



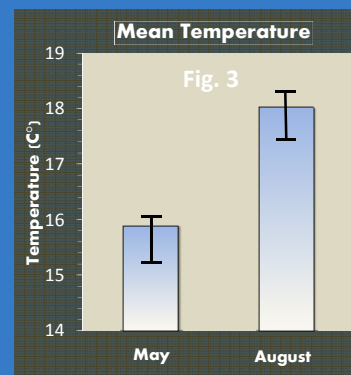
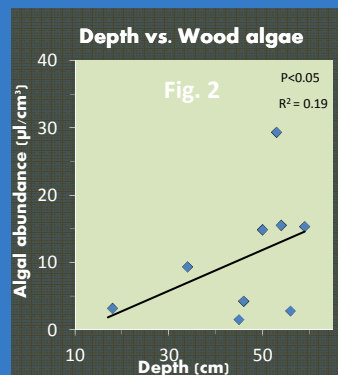
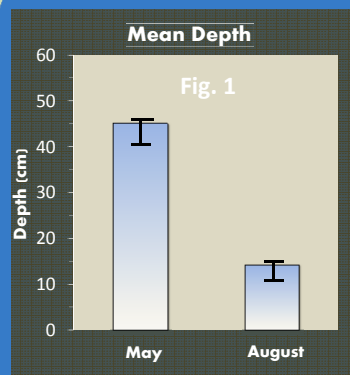
65 locations in Cabin Creek, a northern Minnesota stream, were sampled in May and August 2011.



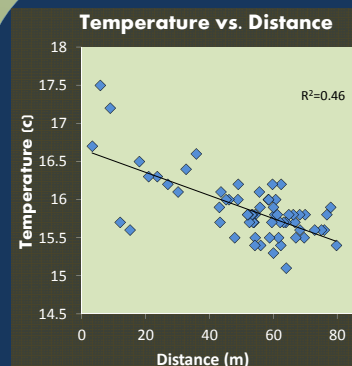
Water velocity, depth and temperature were recorded at each location.



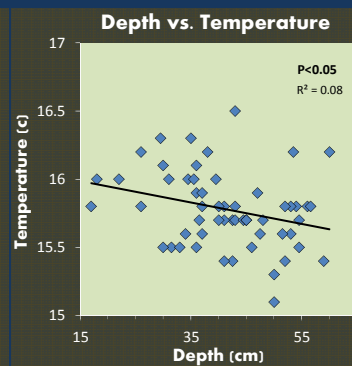
Results



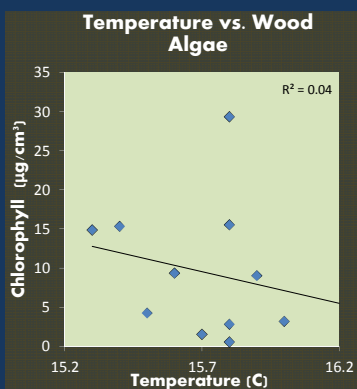
Depth was greater in May than August (Fig. 1), and May showed a correlation between depth and wood algae (Fig. 2). In August, stream temperature was greater (Fig 3) but the correlation seen in May disappeared.



There was a negative relationship between distance downstream and the water temperature in May, but not in August.



There was also a negative relationship between stream depth and temperature in May that was absent in August.



Benthic algae (quantified as chlorophyll) decreased with decreasing streambed temperature. Again, these relationships did not carry over to August.

Conclusions

- Physical characteristics of the stream homogenized from May to August so that stream depth, temperature and velocity became more uniform.
- The parameters that were found to significantly affect algae concentrations in May had no such affect in August, possibly due to this homogenization.



Acknowledgements

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