

Use of Benthic Macroinvertebrates in Determining Water Quality of the New River

Rachel Buchanan

Field Biology and Ecology

Michael .J. Baranski (Instructor) and Katie Bender(Assistant)

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Abstract

Chemical and organic water pollution not only impacts the organisms living in freshwater ecosystems, but also affects the health and quality of life of humans. In recent years, there has been an increased push to monitor water quality and improve water pollution. The use of freshwater benthic macroinvertebrates as indicators of pollution levels has become widely adopted as a cost effective and accurate method for monitoring water quality. Benthos live on the bottom substrates of bodies of water. This category encompasses a wide variety of different taxon groups that display diverse reactions to pollution. Most taxon groups are either intolerant, moderately tolerant, or tolerant to pollution. In habitats with little pollution, intolerant species dominate while tolerant species dominate in habitats with high levels of organic and chemical pollution. By determining the levels of each taxon group and which groups are dominating, scientists are able to calculate a Multimetric Index Value that represents a certain pollution level and overall ecological condition. In this experiment, the New River in western North Carolina was sampled for the years 2004, 2006, 2008, 2010, and 2012 and the Multimetric Index Value was calculated for each year. The New River was consistently given a value of 11 indicating good ecological condition. This was supported by high populations of intolerant benthos and complete absence of certain tolerant taxon groups that thrive in high levels of pollution. The diversity indices indicated low diversity with an average Shannon Diversity Index value of 0.869 but high evenness with an average value of 0.773.