The response of the macroinvertebrate community to low-flow variability and supra-seasonal drought within a groundwater dominated stream

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With 5 figures and 3 tables

Abstract: Information regarding the instream response to long supra-seasonal droughts, extending over more than one season, in largely perennial riverine systems is fragmentary compared to knowledge regarding floods. The macroinvertebrate community of a groundwater dominated river was investigated over an eight-year period which included two supra-seasonal drought events (1992 and 1996–1997). The community responded directly to changes in the discharge regime. Significant differences in the community abundance, the abundance of the amphipod *Gammarus pulex*, diversity indices (Shannon Wiener and Simpson diversity) and the Berger-Parker dominance index were recorded between drought, flow recovery and other (non-drought) years. Drought conditions resulted in extremely low community abundance, *Gammarus pulex* abundance and the Berger-Parker dominance index, and extremely high values of the Shannon Wiener and Simpson diversity indices. Recovery of the community extended over a two-year period and reflected recovery of flow associated with recharge of the groundwater aquifer. The results underline the continuing need for medium to long-term data series to investigate the response of instream communities to flow variability so that extreme events can be placed within the context of natural variability.

Key words: Discharge variability, community change, groundwater, hydroecology, drought, macroinvertebrates.

Introduction

The importance of discharge (flow) variability within lotic ecosystems has increasingly been recognised (Lake 2000, Townsend et al. 1997), particularly...