

On the use of diatom-based biological monitoring Part 2: A comparison of the response of SASS 5 and diatom indices to water quality and habitat variation

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Abstract

Due to the fact that South Africa is a water-scarce country, integrated water resource management based on sound information is essential. Bio-indicators have provided valuable information for water resource management in recent years and have enjoyed increasing popularity. Bio-indicators especially stepped to the forefront with the realisation that aquatic eco-systems are not only a source of water but also deliver several goods and services, as well as being essential for industrial growth and quality of life of many South Africans. This study aimed to quantitatively test two kinds of biomonitoring tools namely diatom-based (SPI and BDI) and macro-invertebrate based (SASS 5) in order to assess their applicability in South African River systems; and whether any additional information can be gained by using the two tools in tandem. The results showed that diatom indices are affected more by changes in water quality than SASS 5, while SASS 5 displayed a higher dependency on habitat quality, as measured by IHAS, than the diatom indices. It is therefore suggested that the two indices be utilised as complementary indicators for integrated assessment of river health.

Keywords: diatoms; Bacillariophyceae; bioindicators; SASS 5; species diversity indices; water quality