

AN INVESTIGATION OF ECOSYSTEM REGIME SHIFTS CAUSED BY REGULATED
WATER RELEASE INTO PHONGOLO RIVER FROM THE PONGOLAPOORT DAM,
KWAZULU-NATAL, SOUTH AFRICA.

BY

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ABSTRACT

Rivers have disturbance regimes of which flooding forms a major part. Scouring floods alters nutrient content, in-channel habitat, benthic macro-invertebrate assemblage structure and water quality in general. A novel macro-invertebrate regime or regime shift created by the artificial flood releases in the Phongolo River was determined by comparing the pre- and post-flood *in situ* physico-chemical aspects, primary production and benthic macro-invertebrate composition of two sites immediately downstream of the dam. nMDS results showed that there is no variation between the pre- and post-flood benthic macro-invertebrate composition of two sites immediately downstream but the sites were significantly difference ($P < 0.05$). The benthic macro-invertebrates were affected by the electric conductivity, oxygen level, ammonium concentration, nitrite concentration and pH when using RDA, and phosphate was correlated with the chlorophyll-*a* when using Person's correlation. It was found that flood reduced the standing stock producers, organic matter and benthic macro-invertebrates abundance, diversity and biomass and therefore a novel of macro-invertebrate regime or regime shift was created by the artificial flood releases in the Phongolo River.

Key words: Phongolo River, regime shift, periphyton, benthic macro-invertebrate and water quality