

ABSTRACT

The numbers, biomass and species composition of the zooplankton community of Hellshire and the mouth of Kingston Harbour were examined, in an effort to use the zooplankton as indicators of the level of environmental stress throughout the area. This involved the development of suitable indices from the zooplankton community and using these to make station linkages.

Sixteen stations were sampled monthly from November, 1985 to March, 1987. Surface collections were made by towing a 200 μm mesh plankton net, in a circular path at a speed of 1 m s^{-1} . Salinity and temperature readings were taken simultaneous with faunal collections. The zooplankton samples collected were identified, enumerated and used in biomass determinations.

Several biological indices were used in the investigation of the spatial distribution of the zooplankton populations in the Hellshire area. The value of these indices in a study of this kind was also assessed. The indices included number of zooplankton species, biomass, total numbers m^{-3} , numbers m^{-3} of particular groups and species found to be abundant in the population (cnidaria, calanoids, cyclopoids, the sergestid Lucifer faxoni, cladocerans, chaetognaths, zooea, engraulid eggs and larvaceans). Species composition was also examined using community indices.

There was generally a decrease in biomass and numbers from maximum values near Kingston Harbour to minimum at Wreck Reef and Wreck Bay. Community indices suggested three distinct areas or water masses in the area. One group exists at the Harbour mouth and surrounding stations (1, 2, 3, 4 and 5); the source of which is the Harbour. The second encompasses the Great Salt Pond and most of the bay stations (6, 7, 8, 10 and 12); the source is the Salt pond and human activity in the bays. The third group included the offshore stations and the control, and these were largely influenced by oceanic water.

The occurrence of heavy rainfall during the sampling period provided an opportunity to describe the zooplankton population under flood as well as normal conditions. The time recovery of the zooplankton community after this major disturbance varied between two (areas near the Great Salt pond) and over four weeks (areas near Kingston Harbour), perhaps according to the proximity of the area to land runoff and the species composition of the zooplankton community.