

An assessment of water quality and plankton in key areas of the East Portland Special Fishery Conservation Area, Jamaica

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An ecological assessment of selected bays and associated shelf areas in East Portland, Jamaica was conducted from April 2014 to March 2015, prior to designation of the East Portland Special Fishery Conservation Area (E.P-S.F.C.A.); declared July 2016. The assessment employed planktonic and physicochemical indices which could be useful not only for selecting ideal areas for protection but also for generating baseline conditions for East Portland and highlighting potential areas of concern in a new fish sanctuary. These areas of concern were further examined and compared due to their potential impact on the overall efficacy of the E.P-S.F.C.A. Some physicochemical parameters, namely; salinity, Total Dissolved Solids (T.D.S.) and conductivity, proved useful for indicating riverine or enriched water masses in the bays. It was therefore evident that areas like West Channel and Blue Lagoon were experiencing elevated nutrients with relatively high nitrate (NO_4^-) concentrations (2.68 and 0.67 mg/L respectively); while areas in San San – fresh water seep and Turtle Crawle displayed relatively high phosphate (PO_4^{3-}) concentrations (0.111 and 0.07 mg/L respectively). With regard to the biological (planktonic) communities, phytoplankton parameters displayed no significant differences between stations, however total chlorophyll *a* and distribution of specific size fractions were useful for confirming nutrient-loading at areas such as; Turtle Crawle and Blue Lagoon. Zooplankton community analyses indicated that inside-bay stations were similarly dominated by herbivorous calanoid copepod spp. such as *Acartia* spp., while outside-bay stations had more characteristic representation of a diverse zooplankton community, with greater abundance of carnivore groups including: Medusae, Chaetognatha, Cyclopoida, and fish larvae (ichthyoplankton). The areas exposed to greatest enrichment, based on the biotic and abiotic indices were; San San Bay and West Channel, these areas are recommended for prioritization and continued monitoring in the E.P-S.F.C.A.

