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Effects of dredging operations on the demersal fish fauna of a South American tropical–subtropical transition estuary

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Changes in the environment and in the composition of fish assemblages in the Paranaguá Estuary (South Brazil) were assessed by comparisons made before, during and after dredging operations, in the same months and areas studied in the previous year. Interactions between year and month were observed for salinity. During the dredging year, fish total density was 2 individuals m−2 and with a total biomass of 104 gm−2 (among 31 species captured). For the same period the year before, 0·3 individuals m−2 and 3 gm−2 were captured (38 species). The number of species showed significant time v. month interactions, if fish species composition varied for both year and month. Total mean density and biomass showed significant differences for interaction time v. month, and density and biomass in the dredging month September 2001 in the main channel were scientifically different from other months. Interaction times v. area were significant for *Cathorops spixii* (increased biomass), *Aspistorl uniscutis* (increased density), *Menticirrhus americanus* (decreased biomass) and *Cynoscion leiarchus* (decreased density and biomass). This suggests that during the dredging process there is a change in the structure of the demersal fish assemblage. The impact (damage and mortality) induced by dredging on the macrobenthic animals along the dredge path attracted adults of *C. spixii* that reached densities 10 times greater than in the year before. On the other hand, sciaenid species practically disappeared. To contribute to the conservation of the estuarine fish fauna, and maintain fisheries production of the Paranaguá Estuary and surrounding areas, it is recommended that, dredging should be done from the late rainy season to the early dry season. Decisions must consider the ecological cycles of socio-economically important fish species and prioritize the safe disposal of dredged.

Biography

Mario Barletta is an Associate Professor at Oceanography Department of Federal University of Pernambuco (UFPE), in Recife, Pernambuco, Brazil. He is responsible for the lecturing of disciplines as Marine Nekton and Ecology of Estuarine Ecosystems at both Under-graduation and Post-graduation levels. He is registered as Master's and Doctorate Supervisor at the Oceanography Post-Graduation Program (UFPE), and at the Ecology Post-Graduation Program at Nacional University of Colombia (Medellin). Research interests are on estuarine and coastal ecology, experimental design for hypothesis testing and data handling for ecological studies and pollution on marine wildlife. Since 2015, he is an Associate Editor of *Frontiers Environmental Science/Marine Science* (specialty section of Frontiers in Marine Ecology and Marine Pollution and Environmental Conservation) (Nature Publishing Group - www.frontiers.org).

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