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SPATIAL AND TEMPORAL VARIABILITY OF THE SHALLOW WATER BENTHIC FAUNA AT ADMIRALTY BAY, KING GEORGE ISLAND, ANTARCTICA

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A time-series programme was initiated in 2002 to distinguish potential anthropogenic impacts from natural ones near the Brazilian Antarctic Research Station Comandante Ferraz (EACF). As benthic communities in Antarctic shallow sediments are constantly subjected to natural or anthropogenic disturbances, the main objective of this study was to determine the level of temporal variation in macrofaunal abundances in Admiralty Bay using a Beyond BACI design. Five areas were used: two close to research stations (EACF and Machu Picchu); and 3 away from them (Botany Point, Thomaz Point and Hennequin Point). Three sediment replicates have been sampled with a van Veen grab (0.056 m^2), at the beginning and end of each summer (2002/03 and 2003/04), from each of 3 depths (20, 30 e 60 m). A nested ANOVA (area and month nested within years) was used to detect if “within year” variability was greater than differences “between years”. The main macro-infaunal groups found were annelids (70-85%), crustaceans (10-20%), and molluscs (5-10%). Total densities varied spatially mainly because of polychaetes, oligochaetes and bivalves contribution near EACF compared to the other areas. This spatial variation at 20 m was 3-fold lower than the intra-annual density variation. The “within year” was more significant than the “between years” differences. These results indicate that fauna densities are highly variable in a short-time scale (2-month period), and no apparent differences have been found between years, except for cumaceans in 60m depth. No significant short-time temporal changes related to human activities have been detected, although sites near EACF have shown some relevant differences from the reference areas in terms of faunal abundances, especially at 20m. Further investigation is necessary to reveal the true nature of this spatial variability, and its relationship with potential anthropogenic impacts. It is suggested that the short-time changes in macrofaunal abundances at Admiralty Bay may be related to water column production, hydrodynamic conditions and seasonal variation in ice cover (e.g. sediment ressuspension, ice cover, terrestrial input).