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Long-term changes of zooplankton volumes in the California Current System. The Baja California region

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A retrospeciive anaiysis oi zooplankton volumes (1951 to 1996) was performed for the area between Punta Baja (30°N) and Punta Abreojos (26 ?ON) in relatlon to the warming anomaly that has taken place in the California Current System during the last 2 decades. The seasonal cycle of median standing stock of zooplankton In this area showed a moderate alternation between h~ghva lues from June to October (median monthly volumes between 86 and 108 m1/1000 m") and low values from Kovember to May (58 to 77 m1/1000 m3). The quarterly long-term means of zooplankton volumes were the lowest in winter, as were wind speeds. The standard deviations associated with the long-term means indicated interannual variability was higher than seasonal variability. The time series showed an interval of high zooplankton volume between 1952 and 1957. Following the strong ENSO (El Nifio Southern Oscillation) of 1957-1958, a period of low values occurred which extended into the early 1960s. There was a slow recovery of zooplankton biomass through the rest of the 1960s, but it did not reach the earlier high values. Available data suggest the increasing trend reached a peak in 1975. Subsequently, from 1976 to the ENSO of 1982-1983, the biomass decreased. For the remainder of the 1980s, the few existing data showed an erratic behavior of the biomass. In the 1990s, there has been a decrease to values even lower than those observed durlng the 1957-1958 ENSO. Nonseasonal anomalles for zoop1.ankton and environmental variables were significantly different (p < 0.001) anlong decades but not between the northern (30" to 28" N) and southern (28" to 26" N) areas. The decrease in zooplankton volume in this region over the last 2 decades is less than that reported for the Southern California Bight. This may be partly caused by seasonal northward movements of tropical zooplancton species along the Baja California coast, Mexico.

Palabras clave: valoración económica, Nyctiphanes simplex, Hidroacústica, Climatic changes