

## Multidecadal trends in mesozooplankton biomass off Peru from 1961-2012

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Anchovy (*Engraulis ringens*) is the most important fish species in the Northern Humboldt Current System (NHCS) off Peru and is highly exploited by the world largest monospecific fishery. This species as well as most other pelagic resources mainly prey on zooplankton. To better understand the decadal dynamic of forage fish in the NHCS here we aim at estimating the mesozooplankton biomass from 1961-2012. Mesozooplankton biomass was estimated from samples collected with Hensen net by using a regression between its biovolume and wet weight. The regression was calibrated from 150 zooplankton samples collected at night during four surveys (1996, 1998, 2000 and 2003) and for which precise information was available on the relationships between biovolume and wet weight. The regression model was applied on an exceptional time series encompassing 140 cruises performed by the Peruvian sea institute (IMARPE) between 1961 and 2012. Spatial patterns of mesozooplankton biomass were then studied using a geostatistic model with external drift. Clear multidecadal patterns occurred and two regime shifts have been evidenced in 1973 and 1992. Mesozooplankton biomass was highest before 1973 ( $59 \text{ g.m}^{-2}$ ). A drastic decline occurred then after ( $17 \text{ g.m}^{-2}$  from 1974 to 1991). Then since 1992 a slight increase in mesozooplankton occurred ( $26 \text{ g.m}^{-2}$ ) without reaching the levels observed during 1960s-1970. A clear seasonal pattern occurs with significantly more biomass in spring than in other seasons. Mesozooplankton biomass was also significantly higher offshore than over the shelf. Anchovy biomass was significantly and positively correlated with mesozooplankton biomass.

Key-Words: Biomass, Mesozooplankton, secondary production, Wet Weight, regime shift, Peru.

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