

Spatio-temporal variability of zooplankton standing stock in eastern Arabian Sea inferred from ADCP backscatter measurements

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The study focuses on the zooplankton standing stock in the eastern Arabian sea (EAS) and aims to understand its spatio-temporal variation using ADCP (acoustic Doppler current profiler) backscatter measurements. The ADCP moorings were deployed at seven locations on the continental slope of the west coast of India; of which we have used data from October 2017 to December 2023. The monofrequency ADCP at operating frequency of 153.3 kHz uses backscatter from sediments or organisms such as copepods, ctenophores, salps and amphipods greater than 1 cm to calculate current profile. The backscatter is obtained from echo intensity using RSSI conversion factor and after doing necessary calibrations. The conversion from backscatter to biomass is based on volumetric zooplankton sampling at the respective locations. Analysis of the data over 25-140 m shows that the backscatter and zooplankton biomass decrease from the upper ocean (215 mg m⁻³ biomass contour) to the lower depths. Seasonal variation is noticed in the monthly climatology of zooplankton standing stock (integral of the biomass over the 20-140m water column) along with change as we move to northward slope moorings in EAS. Variation range of standing stock is lowest at Kanyakumari followed by Okha, both of which lie at southern and northern boundary of EAS respectively. Complementary parameters are used to explain the processes leading to growth or decay in zooplankton biomass and on their migratory behaviour. Additionally, we have studied the effect of wind induced vertical mixing events. The findings of this research will contribute to a better understanding of the zooplankton dynamics in the EAS and provide valuable insights into the seasonal and annual cycles of zooplankton standing stock.

Key words: ADCP, zooplankton, backscatter, Arabian sea, biomass and standing stock