A 10-Year Time Series of Zooplankton Anomalies off the British Columbia Coast

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Abstract

Zooplankton biomass and species composition have been sampled since 1985 at a set of standard locations off Vancouver Island. From these data, I have estimated multi-year average seasonal cycles and time series of anomalies from these averages. Amplitude and timing of the seasonal cycle differ between shelf and offshore locations. Minimum biomass is in winter (about 1-2 g/m^{-2} dry weight) and in all sub-regions. Maximum is in late spring on the continental shelf (7-8 g/m^{-2}) and in mid- to late summer seaward of the shelf-break (6-7 g/m^{-2}). The summer-autumn decline of herbivorous copepod biomass on the inner and middle parts of the shelf occurs during a period of sustained high food supply (3-8.5 mg/m^{-3} chl *a*) and is evidence for rapid advective export of surface-layer zooplankton from the continental shelf during the summer upwelling season. Most of the dominant taxa show interannual anomalies that are both statistically and ecologically significant. The zooplankton anomalies last rather a long time (0.3-5 years, depending on taxonomic group) and are larger along and seaward of the continental shelf break than on the continental shelf. They also occur throughout the span of the time series (not notably stronger in El Niño years). Both time scale and phasing of the anomalies suggest coupling to a longer-term change in North Pacific atmosphere/ocean conditions starting about 1988.

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