

Seasonal dynamics of zooplankton at station K2, NW Pacific, reconstructed from archived ADCP data

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By using the archived mooring ADCP data, we obtained time-series of acoustic backscattering strength at station K2 (47°N, 160°E), the western subarctic North Pacific. In the pelagic water column, main acoustic scatterers are thought to be zooplankton. Actually, many researches showed that the acoustic backscattering strengths have good correlation with zooplankton biomasses in many area of the oceans. In this study, we reconstructed zooplankton dynamics using the acoustic backscattering strength as proxy of zooplankton biomass. ADCPs were moored at 370-400 m in depths at the K2 from 2015 summer to 2018 summer. The echo intensities recorded by ADCPs were converted to acoustic backscattering strength (Sv) in dB according to the following equation (Deines, 1999);

$$Sv = C + 10\log_{10}((T_x + 273.16) \times R^2) - L_{DBM} - P_{DBM} + 2\alpha R + K_c(E - E_r)$$

where C is an empirical constant, T_x is the temperature of the transducer, R is the range along the beam to the scatterers, L_{DBM} is the transmit pulse length, P_{DBM} is the transmit power, α is the absorption coefficient, K_c is a conversion factor for echo intensity from counts to dB, E is the echo intensity in counts, and E_r is the reference echo intensity which was taken as the instrument-specific lowest measured value over the mooring period. Although we could not obtain the acoustic data between sea surface and ca 30 m in depth due to side lobe effect of sound, four years time-series of backscattering strengths between 30 and 350 m was successfully collected. In the poster, we will describe seasonal variability and diel change of acoustic backscattering strength at K2. During the summer of 2016, strong current velocity was observed and the moored ADCP sank down to 660 m in depth. We will also discuss zooplankton dynamics during the event.

Keywords: zooplankton, acoustic backscattering, western subarctic North Pacific