

Ecological studies on zooplankton by using acoustic technic

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Since acoustic backscatter data has higher temporal and vertical resolution with a longer sampling duration, the backscatter data obtained from several types of acoustic devices (e.g. ADCP, AZFP, echo sounder, TAPS) have been used to describe the temporal and spatial variability of zooplankton biomass and migration over decade. Mooring observation of the acoustic device allows the sampling of interannual and seasonal variability as well as episodic events such as eddies and storms. Usefulness of the acoustic mooring in barely accessible area such as seasonal ice zones is also well known. Acoustic backscattering strength from organisms is known to be dependent on target size, anatomical characteristics and orientation, and the frequency of the incident sound. These dependences can be used to make inferences about classification of target organisms and their size distribution. Recent studies have used the differences in backscatter measurements at multiple frequencies to attempt to identify the scatterers. In this presentation, we will introduce our acoustic studies on zooplankton ecology; vertical migration and its seasonal variability of zooplankton in the subtropical western North Pacific by using moored ADCP, seasonal dynamics of zooplankton and identification of the dominant scatterers in the southern Chukchi Sea, Pacific Arctic, by using moored AZFP (Acoustic Zooplankton Fish Profiler), and high-resolution profiling of zooplankton vertical distribution by vertical haul of AZFP in the subarctic western North Pacific. Additionally, we will also discuss problems found out through the studies and future direction for the acoustical zooplankton studies.

Keywords: acoustic technic, zooplankton ecology, ADCP, AZFP