

Supplementary Material

1 Zooplankton data

The lack of true in situ identification of the backscatter layers is an uncertainty in our study. It is, however, apparent that what the ADCPs are ‘seeing’ is more represented by mesopelagic fish and euphausiids, than by the smaller, but abundant, calanoid copepods (e.g. Melle et al., 1993). For completeness, we scrutinized four hauls with a HydroBios Multinet (five nets, 200 µm mesh size and 0.25 m² opening), that were made adjacent to the ADCP mooring position between June 2013 and May 2014. The samples were hauled vertically from a maximum depth of 1000 m towards the surface. The depth stratified samples were hauled vertically from a maximum depth of 1000 m towards the surface during the day and the night at selected stations. An attached flow meter was used to record the amount of water filtered during the net haul. The zooplankton samples were preserved in 4 % formaldehyde solution, and in the laboratory, they were split into subsamples to contain around 200 to 300 individuals. Among the mesozooplankton at stations N04 and N05 (Figures S1), *C. finmarchicus* numerically dominated in all samples. The most abundant species within the group ‘Others’ included *Pseudocalanus*, *Oithona*, *Temora* and *Metridia spp.* *C. finmarchicus* was most abundant in the uppermost 100 meters, which is within their depth range of DVM (Dale and Kaartvedt, 2000). Zooplankton was mostly confined to the upper 200 m with much less abundance in deeper layers. Collectively, the zooplankton distribution falls both within the thick backscattering layer but also frequently within regions of minor backscatter, which confirms that zooplankton does not constitute the main backscattering layers.