

Comparing highly resolved analogous Eulerian/Lagrangian model setups of calanoid copepods for the study of aggregation patterns

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Plankton hauls offer strong resistance when dragged through the water. Hence, in order to harvest plankton organisms efficiently, it is important to gain knowledge into the aggregation mechanisms of plankton in layers or at specific local sites that might result from the interplay between hydrodynamic features and behavioral traits. Calanoid copepods are known to show complex types of migration patterns related for example to phototactic behavior, feeding and presence of predators. The emerging spatial structure of plankton densities is studied by means of two analogous model setups using the SINMOD ocean model. One eulerian framework defining an initial biomass concentration field and a correspondent lagrangian setup for a generic epi-pelagic model calanoid copepod is associated with assumptions on specific vertical migration patterns. The short term changes (hours) in the resulting spatial structures between the two model setups are analyzed.

Keywords: Ecosystem modelling, spatial distributions, ocean circulation models, plankton aggregations, Eulerian model, Lagrangian model

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