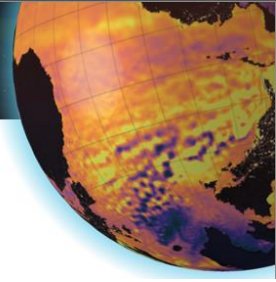


Low and mid-trophic levels reanalysis in the European Copernicus Marine Service catalogue: state of the current product, and development plan. Applications to sciences and society

Since mid-2019, densities of meso-zooplankton and micronekton 1/12° daily global reanalyses [1] are available from the European Copernicus Marine Data Store. The product covers the period 1998-2022 and is extended every year. Meso-zooplankton organisms (200µm-2mm) is part of the low-trophic level of marine ecosystems. These organisms drift along with the water masses. On the other hand, micronekton organisms, constituting the mid-trophic level, are bigger (2-20cm) and able to swim over short distances. These organisms realize diel vertical migrations from the deep ocean (400m to 800m) where they hide from predators during the day towards the surface where they feed at night, and back. Organism densities are computed using the Lower and Mid Trophic Levels (LMTL) module of the Spatial Ecosystem And POPulation DYnamic Modeling (SEAPODYM) framework [2,3]. The LMTL dynamics is modelled with a system of advection-diffusion-reaction equations. Whereas the horizontal extension of the global ocean is realistic, the vertical dimension is simplified into three layers. Layers matches the vertical distribution of organisms that is observed using active acoustics techniques. The six micronekton groups are defined according to their diel vertical migration over the three layers: three groups inhabit the same layer during day and night, and three groups migrate between a deeper layer during the day toward a shallower layer at night. We propose here to review the state of the art of this product together with applications in science and society. Indeed, micronekton as prey of top predators, plays a key role to understand the behaviour and to evaluate the state of health of populations of a variety of species of ecological and economic interests such as tunas, swordfishes, or dolphins. Moreover, the active movement of these organisms supports an export of carbon from the surface (ingestion of carbon through feeding) toward the deep ocean (e. g. egestion of carbon by fecal pellets) which plays a major role on the regulation of the earth climate. [1] Titaud O., Conchon A., Mérillet L., Goeman N., EU Copernicus Marine Service Quality Information Document for the Global Ocean Low and Mid Trophic Levels Biomass Content Hindcast Product, Issue 4.1. [2] Lehodey, P., Conchon, A., Senina, I., Domokos, R., Calmettes, B., Jouanno, J., Hernandez, O., and Kloser, R. (2015) Optimization of a micronekton model with acoustic data. – ICES Journal of Marine



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