

EGU22-9777

<https://doi.org/10.5194/egusphere-egu22-9777>

EGU General Assembly 2022

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



(Sub-)mesoscale Dynamics in the Arctic and its Impact on the Flux of Nutrients and Carbon: a case study from the MOSAiC expedition

Alejandra Quintanilla Zurita, Benjamin Rabe, and Ivan Kuznetsov

Alfred Wegener Institute, Physical Oceanography, Bremerhaven, Germany

In this work, we will show the main ideas for studying how the (sub-)mesoscale processes impact the flux of nutrients and dissolved inorganic and organic carbon (DIC/DOC) in the upper layers of the central Arctic Ocean. These fluxes are essential since they are one of the primary mechanisms to connect the deeper layers of the ocean with the upper part: nutrients stored deeper can go to the surface mixed-layer and be used for primary production. On the other side, the Arctic Ocean is considered a carbon sink and contributes to the biological pump. For doing this, we are using the high-resolution numerical model FESOM-C to assimilate the hydrographic observations from the Multidisciplinary drifting Observatory for the Study of Arctic Climate (MOSAiC) expedition (2019-2020) to describe the (sub-)mesoscale dynamics (eddies, fronts). We will make use of the OMEGA equation to disentangle the vertical fluxes due to diabatic and adiabatic processes in the model output. Finally, we will analyse those results with in-situ observations of nutrients and DIC/DOC to estimate associated mass fluxes.