Svetla Miladinova et al., J Marine Sci Res Dev 2016, 6:4(Suppl)
http://dx.doi.org/10.4172/2155-9910.C1.013

Sensitivity of the Black Sea's ecosystem to hydrodynamic processes

Svetla Miladinova, Adolf Stips, Elisa Garcia-Gorriz and **Diego Macias**
CEC Joint Research Centre, Italy

The Black Sea, which is one of the largest inland water basins in the world, is characterized by the strong halocline at 70-150 m, the Cold Intermediate Layer (CIL) at ~70 m and the doming of the isohalines due to the cyclonic current with significant seasonal and inter-annual variability. The evolution of the Black Sea physical processes together with biogeochemical ones and their relation to atmospheric conditions and anthropogenic loads are studied using General Estuarine Transport Model and a specific ecosystem model representing the classical omnivorous food web with seven state variables. In periods of cold winters, the CIL's volume growths substantially, its mean temperature decreases and it moves downward. Consequently, oxygen can penetrate deeper into the water column and could lead to continuous growth of large plankton in the CIL's region even after winter/spring bloom. CIL's formation influence on the ventilation of low oxygenated zone is clearly identified. The vertical flux of nutrients from below the halocline in winter is found to be a key factor for new production in the open sea as it is the main source of nutrients there. Depending on the severity of winter meteorological conditions, inter-annual variability exists with more intense mesoscale circulations leading to considerable exchanges and transports between the coastal and offshore waters. Thus, the primary production in the open sea waters is intensified under winter conditions that favor mixing and profound oxygen penetration.

Biography

Svetla Miladinova has completed his PhD from Sofia University, Bulgaria and Post-doctoral studies from University of Liege, Belgium. She has shown herself to be competent researcher in numerical modelling of hydrodynamic and heat- mass transfer problems. She has more than 25 years of Post-graduate research experience.

svetla.miladinova@jrc.ec.europa.eu

Notes: