



Turbulent transport of marine biogeochemical tracers

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The marine ecosystem dynamics in the subtropical regions is controlled by the availability of nutrients. Their supply depends on lateral transport from higher latitudes, which is affected by the characteristics of the oceanic mesoscale turbulence. In many cases turbulent transport is parameterized in terms of eddy diffusion. We here test the validity of this approach in a mesoscale turbulence model coupled to a simple ecosystem model. We show that the parameterization can be profitably used, provided that an effective eddy diffusion coefficient that depends on the reaction time scale of the transported tracers is used. If the diffusion coefficient valid for conservative tracers is used to express diffusion of nutrients and plankton, turbulent transport and biological productivity can be significantly overestimated.