



## **The impact of (sub-)mesoscale eddies on the soft-tissue carbon pump**

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An important element of the Earth's carbon cycle is the soft-tissue carbon pump: the growth, sinking and remineralisation of the 'soft' parts of oceanic biota. In this process, transport of nutrients and biota by (sub-)mesoscale eddies may play an important role. Here we investigate the impact of a single submesoscale eddy on the soft-tissue carbon pump using a plankton model coupled to a high-resolution hydrodynamic model. Because the strength of the soft-tissue carbon pump is strongly influenced by variations in the carbon:nutrient ratio of the biota, we use a plankton model that accounts for such variations (contrary to the popular NPZD models that take the elemental composition of plankton fixed). Our simulated eddy is baroclinically unstable which leads to an enhancement of the vertical mixing and a net upward transport of nutrients. This in turn leads to a net upward transport of carbon and hence a weakening of the soft-tissue carbon pump because of a lower carbon:nutrient ratio of the biota and a lower nutrient utilisation. Furthermore, the interplay between upwelling and plankton growth leads to fine structure in the biomass distribution.