Mesopelagic respiration in the NW Mediterranean as a component of the efficiency of the carbon pump.

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The rate of biological consumption of oxygen by remineralisation processes is a crucial term for the quantification of the carbon exported to the deep ocean. Oxygen consumption and the remineralisation of carbon and nutrients are stoichiometrically related. In this way, oxygen respiration limits the efficiency of the carbon pump.

High respiration rates have been found in Mediterranean deep waters compared to other oceans and have been reported as due mainly to dissolved organic matter (DOM) respiration. This has been linked to convective mixing supplying DOM and oxygen to the deep waters and to the high temperatures, which are characteristics of the NW Mediterranean basin. Therefore, the assessment of mesopelagic respiration in NW Mediterranean accounts for both the particulate and dissolved organic matter which sinks out of the mixed layer and is considered to provide a more suitable estimate of the export production.

Here we report on mesopelagic and deep respiration rates in NW Mediterranean during the EFLUBIO-2 cruise (between March 25 and April 5 2005). The studied area in the Gulf of Lions is a major site of carbon export, since strong deep mixing provides nutrients for phytoplankton growth. The study included an area south of the Nor-Balearic Front outside the bloom area. We use hydrographical, nutrient, oxygen and carbon data to model the biologically induced changes of these variables below the mixed layer. These estimates are discussed in the context of the regional carbon

export and compared with export production data computed from the net community production of the mixed layer.