Geophysical Research Abstracts,
Vol. 10, EGU2008-A-09680, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-09680
EGU General Assembly 2008

Long-term study of settling particle flux and carbon export at the DYFAMED open sea station (Ligurian Sea, Northwestern Mediterranean)

J.-C. Miquel, J. Martín, B. Gasser, A. Rodriguez-y-Baena, T. Toubal, S. Fowler
IAEA Marine Environment Laboratories, 4 Quai Antoine 1er, Monaco, MC98000 Monaco.
(J.C.Miquel@iaea.org / Phone: +377. 97977259)

The downward flux of particulate organic carbon in the sea is considered a prime vector for the effective sequestration of atmospheric CO_2. During the last decades, sediment traps have provided crucial insights into the transfer of total and organic particulate matter from the surface ocean to the deep sea. These studies soon evidenced the importance of long-term sampling stations in order to cope with the temporal variability and the complexity of the mechanisms behind carbon flux. The DYFAMED time-series station, located in the open Ligurian Sea, is one of the few pluriannual flux programs in the world and the longest in the Mediterranean Sea. Downward fluxes of particles, carbon and other major elements have been measured with sediment traps between 1986 and 2005 at 200 and 1000 m depth, plus additional depths during shorter periods. Fluxes displayed a marked seasonal pattern with the highest fluxes occurring during winter and spring, and lowest through late summer and autumn. Mass fluxes were generally maximal in winter and corresponding carbon fluxes in late spring. Variability in particulate carbon fluxes over time results from the interplay of different processes, such as atmospheric (Saharan) dust deposition, physical mixing of the upper water column in winter and the spring plankton bloom. These controlling factors are more evident at 200 m depth, although a reasonably good agreement exists between particle fluxes at both depths over the years, indicating a relatively efficient transport of particles from the upper ocean to the deep sea. Despite considerable interannual variability, the DYFAMED time series display an increasing trend of downward fluxes

during the last decade, which may be connected to ongoing climatic and ecological changes in the Mediterranean Sea.