Geophysical Research Abstracts,
Vol. 11, EGU2009-4449, 2009
EGU General Assembly 2009

Present-day fluxes of coccolithophores in the pelagic Ionian Sea: seasonality and interannual variations

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Within project MOCCHA of EuroMARC, sediment sequences are explored at selected sites, characterised by high sedimentation rates and laminations, allowing to obtain high resolution climate records.
The aims of the project are to unravel short-term climate cycles, possibly linked to solar forcing, and to define how these changes are recorded back in time. However, in order to interpret past climate variations, a clear understanding is needed of the mechanisms underlying the observed variability and of the response of the ecosystem to the environmental changes.
We present therefore the data from a time-series record from sediment traps, located at 500 m in the Ionian Sea. The results, coupled with the related environmental variables, allow to describe the seasonality of the flux and the interannual variability. We focus in particular on the record of coccolithophores, which are the main carbonate-producers in the oligotrophic eastern Mediterranean.
The coccolithophore species assemblage composition shows a clear seasonal signal through the investigated time interval. The summer community is well developed with warm-water surface-dwelling species and a typical deep-dwelling association. In contrast the winter community is less diversified, with a clear dominance of the cosmopolitan species Emiliania huxleyi. These variations are strongly associated to the sea-surface-temperature cycle and to the development of the seasonal thermocline.
Moreover, comparison of the record from different years shows a strong interannual unevenness, in both total particle and coccolithophore flux. This is most likely related to both variations in the external (dust-related) flux and to variations in the mesoscale circulation, which affects the timing and the extent of nutrient supply in the photic zone.