



Long-term trends in picoplankton dynamics in the Gulf of Naples

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Flow cytometry is commonly used to investigate picoplankton (<2 micron), a key component of marine food webs. This study presents flow cytometric data of picophytoplankton and heterotrophic prokaryotes collected at the coastal Long-Term Ecological Research (LTER) MareChiara station in the Gulf of Naples over nine years (2007–2015). *Synechococcus* spp., *Prochlorococcus* spp and picoeukaryotes (several subgroups) were distinguished based on scatter and fluorescence. For heterotrophic prokaryotes, also Low Nucleic Acid (LNA) and High Nucleic Acid (HNA) subpopulations were distinguished and counted.

Nutrient availability and temperature significantly influence picoplankton abundance and cytometric diversity, confirming a trend observed in other coastal areas. From 2007 to 2015, notable trends in picophytoplankton biomass and community structure were revealed, with results suggesting a marked increase in certain phototrophic eukaryotes alongside fluctuating cyanobacterial populations. Flow cytometry confirms its key contribution to providing insights into ecological changes in response to variable ecosystem properties.