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The driving forces of the biotic processes along an offshore gradient in the Ligurian basin (Portofino Promontory) during 2008

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The marine coastal area of the Portofino Promontory, located in the North-East side of the Ligurian basin (Mediterranean Sea), has been studied since 1980's to identify its main ecological characteristics. The large physical, chemical and biological dataset available for this site (LTER sites) represents a powerful tool for the reliable reconstruction of seasonal cycles and allow the differentiation of regular and recurrent patterns from occasional and exceptional events. This long-term monitoring reveled an increases in the average monthly temperature along the water column in the last 10 years compare with the previous decade (1985-1995), with a high inter-annual variability and some specific episodic occurrence of thermal anomalies. The physical features of the water column seems to have a strict relation with the phytoplankton biomass fluctuations.
A detailed study of 2008 intended to analyze a wider area, in order to compare the driving forces influencing the development of biotic process along an offshore gradient.
The hydrological data acquired almost once a month from January 31st to December 23rd 2008 allow to increase the existent dataset with one CTD transect perpendicular to the coast starting from Portofino Promontory towards offshore. The performed spatial analysis evidences the seasonal variations of the column of water and the influence of the local and offshore effects on the biomass concentration. The larger variations, between the local and general current features, are recorded in salinity and in chlorophyll concentration and less in temperature, that results mainly affected by the seasonal effects. The time series acquired along the transect and the comparison between the coastal and offshore stations contributes to describe the characteristic of the coastal and offshore current, that alternatively prevails along the transect. It is not fix the region of confluence, but it swing probably for the intensity of the currents. The near-shore water, on the East corner of Portofino Promontory, is influenced by the Entella river runoff that produces variation especially in salinity, while offshore the contribute of Tyrrhenian and Corsica streams fluctuations prevails. Then the biomass concentration varies strongly related to the temperature and salinity features. In fact the chlorophyll data shows a higher value in winter at surface in the coastal stations but not in the offshore ones. This surface picks are probably linked to the low salinity value relatives to the meteorological events and consequently to the river runoff. While in spring the offshore water shows an increase of the chlorophyll concentration at about 80 m of depth. This feature seams independent to the coastal events, and could be linked to the open sea processes.