



## The North Atlantic climate and the northwestern Mediterranean plankton variability

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**ABSTRACT:** Climate variability across three distinct spatial scales and the interannual changes of planktonic copepods and jellyfish were studied from November 1966 to December 1993. The results obtained identified a cascade of links between the large-scale climate pattern playing out in the North Atlantic and the local climate variability governing the Ligurian Sea, northwestern Mediterranean. The chain of events appeared driven by the long-term temperature anomalies that in turn played a key role in the relationship between copepods and jellyfish. Indeed, the increase in jellyfish outbreaks during the 1980s was largely favored by high positive anomalies observed in climate at large (North Atlantic), regional (Ligurian Sea), and local (Villefranche Bay) spatial scales and in water temperature. Linked to jellyfish abundance, the dynamics of the relationship between copepods and jellyfish showed a strong modification during the middle-late 1980s, which highlight the top-down effect exerted by jellyfish on copepods. The warming temperatures and the observed ecological changes, high abundance of jellyfish, and marked drop in the abundance of copepods are discussed in the framework of a potential change in the functioning of the planktonic ecosystem indicative of a more regeneration-dominated production system in the Ligurian Sea. Overall, the cascade of links identified by these results should be considered and integrated into the assessment and modeling studies of pelagic ecosystem and biogeochemical fluxes in the northwestern Mediterranean Sea.

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