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The Mediterranean Sea in the Era of Global Change 1: 30 Years of Multidisciplinary Study of the Ligurian Sea

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ABSTRACT

One of the most critical issues in oceanographic and climatic sciences is phytoplankton dynamics: on this depend both the sequestration of excess atmospheric CO₂ through photosynthesis and the proper functioning of marine food systems through plankton productivity. Biological productivity itself depends, to a very large extent, on the availability of nutrients. Hence, there is the need to fully understand the spatiotemporal variability of nutrient concentrations in the surface ocean, together with the physical, chemical and biological parameters that constrain this variability.

The Mediterranean Sea (Med) is considered one of the least productive seas in the world [BET 98]. Nutrient concentrations exhibit a decreasing gradient from west to east [MOU 12] that is commonly viewed as a consequence of the peculiar, so-called "anti-estuarine" Med circulation described in the Chapter 3: low amounts of nutrients enter the Med in surface via the Gibraltar Strait, much of which is consumed along the way to the eastern basin, and then exported to deep layers. On the way back to Gibraltar, the remaining nutrients are mostly exported to the Atlantic Ocean, which results in a significant loss of nutritive resources, presumably

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