

LONG-TERM SUBSURFACE DISSOLVED OXYGEN TREND IN THE NW IBERIAN COASTAL UPWELLING SYSTEM (NE ATLANTIC TITLE OF THE COMMUNICATION

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Abstract: This study aims to analyze long-term dissolved O₂ (DO) trend in the NW Iberian coastal upwelling system in order to better understand physical and biological processes affecting biogeochemical characteristics of the subsurface Eastern North Atlantic Central Waters (ENACW). A high-quality 43 yr (1970-2013) data set collected at the 27.1 isopycnal level (representative of ENACW) from an area between 41°-43°N and 9°-11°W was analyzed.

Since the seventies, subsurface DO levels declined with a rate of 0.39 $\mu\text{mol O}_2 \text{ Kg}^{-1} \text{ yr}^{-1}$ despite no sustained decrease trend through time was registered for temperature and salinity. DO tendency to drop ran in parallel with significant increments of both sea surface temperature (SST) and subsurface apparent oxygen utilization (AOU) annual means, pointing to the increase in the subsurface waters residence time as responsible for the deoxygenation processes registered in the study area. Moreover, natural decadal variability of both thermohaline properties and DO annual mean concentrations at the ENACW isopycnal level agreed with changes in the North Atlantic Oscillation (NAO) index. In this regard, we can state that overprinted to the last 40-yr DO decreasing trend observed in the NW Iberian coastal upwelling system, natural subsurface waters oxygenation may have occurred when high positive NAO phases promote the strengthening and eastward expansion of the subpolar gyre, bringing cooler and more oxygenated conditions to the study area.

Key words: deoxygenation, Eastern North Atlantic Central Water, Coastal upwelling, NE Atlantic

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