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POTENTIAL SST DRIVERS FOR CHLOROPHYLL-A VARIABILITY IN THE ALBORAN SEA: A SOURCE FOR SEASONAL PREDICTABILTY?

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Abstract: This study investigates the link between large-scale variability modes of the Sea Surface Temperature (SST) and the surface chlorophyll-a (Chl-a) concentration in spring along the northern flank of the Alboran Sea. To this aim, surface satellite-derived products of SST and Chl-a, together with atmospheric satellite variables, are used. Our results indicate that both the tropical North Atlantic and El Niño Southern Oscillation (ENSO) could trigger the development of anomalous distribution patterns of Chl-a in spring in northern Alboran. This anomalous feature of Chl-a is, in turn, associated with the alteration of the usual upwelling taking place along the Spanish coast at that time of the year (Ramírez et al., 2005; Macías et al., 2007; Lazzari et al., 2011). The skill of the related SST signals, over the tropical North Atlantic and the tropical Pacific, as predictors of the aforementioned Chl-a response in Alboran, has been also assessed through a statistical prediction model with leave-one-out crossvalidation. While the skill of the tropical North Atlantic seems to be limited, the results identified confirm the predictive skill of ENSO to realistically estimate the Chl-a response in Alboran. In particular, during El Niño/La Niña years, this Chl-a response can be robustly predicted with 4 months in advance. Furthermore, in those years when the tropical North Atlantic signal precedes ENSO, the Chl-a response can be also reasonably well predicted. This would enhance, for specific years, the predictive horizon to at least 7 months. The results presented here could contribute to develop a future seasonal forecasting tool of upwelling variability and living marine resources in northern Alboran.

Key words: Alboran Sea, Chlorophyll-a, SST, Climate teleconnection, Seasonal predictability

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