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Coastal and Oceanic SST variability along the western Iberian Peninsula.

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The inter-annual variability of the sea surface temperature (SST) was analyzed along the western Iberian Peninsula in a region ranging from 9.5^{o}W to 22.5^{o}W and from 42.5^{o}N to 37.5^{o}N with a spatial resolution of 1º$\times$1ºfrom 1900 to 2008. Both coastal and oceanic SST showed an overall increase with warming and cooling cycles similar to those observed in the North Atlantic region (IPCC, 2007) and in previous regional studies: García-Soto et al. (2002) in the area close to the Celtic shelf and deCastro et al., (2009) in the Bay of Biscay. The difference between ocean and coastal SST (ΔSST) was not constant all over the study period. In general, ΔSST tends to increase during the warming periods and to decrease during the cooling periods. Ocean water is more affected by the different warming-cooling cycles than coastal water; this different warming rate could be explained in terms of local and remote forcing factors. According to previous research, the temperature gradient between coast and ocean is mainly due to coastal upwelling in spring- summer (Santos et al. 2005; Álvarez et al. 2008a) and to the water cooling developed in shallow waters at the end of autumn due to net heat loss from surface (Fiuza, 1983; Deschamps et al. 1984). In addition, the Thermohaline Circulation (THC) highly influences SST features in the North Atlantic region carrying warm water from the tropics to northern latitudes. There is a link between the THC variability and the AMO index (Ganachaud and Wunsch, 2000). The AMO index characterizes the large-scale pattern of multidecadal variability of SST calculated as the SST anomaly averaged for the North Atlantic region. Macroscopically, the ocean and coastal SST follow the cycles observed at the whole North Atlantic region (expressed in terms of the AMO index). Nevertheless, the correlation between AMO and SST is observed to decrease coastward. Actually, the inter-annual variability of coastal SST water is best described in terms of both THC and coastal upwelling.

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