

Influence of the North Atlantic oceanographic and climatic parameters on the Spanish European Eel population recruitment: relationships in the past and for a future climate change

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The status of the European eel population is critical.; the annual recruitment of glass eel to European waters in 2015 is 1.2% of the 1960–1979 level in the ‘North Sea’ area, and 8.4% in the rest of Europe (ICES 2015) . There are a number of anthropogenic impacts potentially affecting eel population including commercial exploitation, habitat loss, dam and weir construction, hydropower, pumping stations and surface water abstractions. Furthermore, the first eel stages and larval migration and marine survival are heavily influenced by oceanic and climatic factors since the species breeds in the Sargasso Sea and migrates to the continental shelf of the Atlantic coast of Europe and North Africa. Therefore, the study of the relations between recruitment and oceanic conditions may allow to study the potential effect of climatic change on the future eel recruitment and therefore stock.

In the present study, the relation between glass eel recruitment and oceanic and climatic factors has been studied. Historic glass eel catches data beginning in the 50s from two Mediterranean and two Atlantic estuaries have been used as a proxy of recruitment. The relation of catches with the main oceanographic and climatic factors identified in the literature was established using an ocean reanalysis, the Simple Ocean Data Assimilation (SODA) and determined which variables are significantly related to the number of catches. The analysis shows significant relationships between catches and oceanic (Surface Downward Stress, Sea Water Temperature and Sea Water Velocity) and atmospheric (NAO Index, AMO Index) variables. Subsequently, we applied the results of three climate models (GFDL-ESM2M, CanESM2 and CNRM-CM5), associated with the Coupled Model Intercomparison Project Phase 5 (CMIP5) under two simulations of climate change (RCP4.5 and RCP8.5), both associated with the 5th Assessment Report of the IPCC, for possible future influences on the eel.

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