{rokbox title=|Merluccius merluccius :: Foto: Jorge Hernández (IEO)| thumb=|images/stories/ieo/imagenespublicaciones/merluza_640_thumb.jpg|}images/stories/ieo/imagenespublicaciones/merluza_640.jpg{/rokbox}

M. Hidalgo, T. Rouyer, J. C. Molinero, **E. Massutí**, **J. Moranta**, **B. Guijarro**, N. Chr. Stenseth (2011). **Synergistic effects of fishing-induced demographic changes and climate variation on fish population dynamics**

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Abstract: The synergistic effects of fishing, climate and internal dynamics on population fluctuations are poorly understood due to the complexity of these interactions. In this paper, we combine time series analysis and simulations to investigate the long-term dynamics of an overexploited population in the Mediterranean Sea, and its link with both fishing-induced demographic changes and hydroclimatic variability. We show that the cyclicity of the catch per unit of effort (CPUE) of European hake *Merluccius merluccius* (EH) vanished in the 1980s, while the correlation between the CPUE and a local environmental index increased. Using simulations, we then show that the cyclicity observed in the EH biomass before the 1980s can have an internal origin, while that its disappearance could be due to the fishing-induced erosion of the age structure. Our results suggest that fishing can trigger a switch from internally generated to externally forced population fluctuations, the latter being characterised by an increasing dependency of the population on recruitment and ultimately on environmental variability. Hydroclimatic modifications occurring in the Mediterranean in the early 1980s could have enhanced these changes by leading to a mismatch between early life stages of EH and favorable environmental conditions. Our conclusions underline the key effect of the interaction between exploitation and climate on the dynamics of EH and its important consequences for management and conservation.

Keywords: Demographic truncation, Fish population dynamics, Synergistic effects climate-fishing, European hake, Mediterranean climate.