

{rokbox title=|Community-weighted mean values (CWM) and community-weighted variance (CWW) of sea surface and bottom temperature (SST and SBT, respectively), sea surface salinity (SSS), surface and bottom temperatures tolerance ranges (STT and BTT, respectively) and area occupied (Area), latitude (Mean latitude) and latitudinal range, depth (Mean depth) and depth range :: Image:

Authors|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-csic-community-ecological-traits-hidalgo-2025-thumb-et-al.jpg|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-csic-community-ecological-traits-hidalgo-2025-et-al.jpg{/rokbox}

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[Community's ecological traits reflect spatio-temporal variability of climate change impacts](#)

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Abstract: Climate change is triggering shifts in species distribution eventually altering communities' biogeography. The composition of a community in terms of its species' ecological niche informs of a community's response to environmental conditions and impacts, which is central for a timely conservation. While the thermal niche has been widely explored, given it offers a direct link of warming effects on an assemblage, acknowledging the multivariate nature of a species niche can provide relevant insights of the reorganizations taking place at a community-level. We studied the mean and variance of 10 ecological traits at the community level in two regional ecosystems in the temperate East-Atlantic and the Mediterranean Sea, characterized by a distinct exposure to warming. Our findings revealed major temporal changes and spatial structuring in the traits and ranges explored over the last decades. Apart from confirming the expected general poleward, deep-ward shift, our results highlighted a widening of thermal and latitudinal ranges, possibly related to a 'flexibilisation' of the communities in a context of global change. In addition, temporal patterns reflected how communities have adjusted around regime shifts known in both areas. Regional differences arose concerning the variance of depth ranges and area of distribution, as well as to the global evolution of the communities, which we argue are consequence of their different geographical features and ecological history. The comparison of two large multitaxon assemblages has disclosed a broad-scale motion of response to warming in the benthic-demersal domain. We expect this study will contribute to the understanding of the multivariate nature of global-change effects on marine fauna, which ultimately informs adaptive management.

Keywords:Biogeography,Cantabrian Sea,Community's response,Mediterranean Sea,Meridionalization,Niche,Tropicalization,Warming.