

{rokbox title=|Evolución del hábitat adecuado (en % de cambio respecto al presente) en función de temperatura, luz y profundidad para corales, macroalgas y praderas submarinas :: Image:

Authors|

thumb=|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-ocean-warming-compresses-the-three-dimensional-habitat-of-marine-life-jorda-et-al-2019-thumb.jpg}}images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-ocean-warming-compresses-the-three-dimensional-habitat-of-marine-life-jorda-et-al-2019.jpg{/rokbox}

Gabriel Jorda, Núria Marbà, Scott Bennett, Julia Santana-Garcon, Susana Agusti and Carlos M. Duarte , 2020.

[Ocean warming compresses the three-dimensional habitat of marine life.](#)

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Abstract: Vertical migration to reach cooler waters is a suitable strategy for some marine organisms to adapt to ocean warming. Here, we calculate that realized vertical isotherm migration rates averaged $-6.6 \pm 18.8 \text{ m dec}^{-1}$ across the global ocean between 1980 and 2015. Throughout this century (2006–2100), surface isotherms are projected to deepen at an increasing rate across the globe, averaging -32.3 m dec^{-1} under the representative concentration pathway (RCP)8.5 ‘business as usual’ emissions scenario, and -18.7 m dec^{-1} under the more moderate RCP4.5 scenario. The vertical redistribution required by organisms to follow surface isotherms over this century is three to four orders of magnitude less than the equivalent horizontal redistribution distance. However, the seafloor depth and the depth of the photic layer pose ultimate limits to the vertical migration possible by species. Both limits will be reached by the end of this century across much of the ocean, leading to a rapid global compression of the three-dimensional (3D) habitat of many marine organisms. Phytoplankton diversity may be maintained but displaced toward the base of the photic layer, whereas highly productive benthic habitats, especially corals, will have their suitable 3D habitat rapidly reduced.

Keywords: