

{rokbox title=| Distribution of biotic homogenization and differentiation across surveyed continental shelf regions :: Image: Authors| thumb=|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-csic-marine-communities-follow-farriols-2025-thumb-et-al.jpg|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-csic-marine-communities-follow-farriols-2025-et-al.jpg{/rokbox}

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[Marine communities do not follow the paradigm of increasing similarity through time](#)

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Abstract: Humans have transformed ecosystems through habitat modification, harvesting, species introduction, and climate change. Changes in species distribution and composition are often thought to induce biotic homogenization, defined as an increase in the spatial similarity of species compositions through time. However, it is unclear whether homogenization is common in ocean ecosystems and if changes in similarity exhibit linear or more complex dynamics. Here, we assessed patterns of homogenization or its converse (differentiation) across more than 175,000 samples of 2,006 demersal fish species from 34 regions spanning six decades and 20% of the planet's continental shelf area. While ten regions (29%) recorded significant homogenization, eleven (32%) recorded significant differentiation. Non-monotonic temporal fluctuations in species composition occurred in 15 regions, highlighting complex dynamics missed by before-and-after snapshots that can drive spurious conclusions about trends in similarity. Fishing pressure and temperature helped explain variance in similarity across years and regions. However, the strength and direction of these effects differed by region. Here we showed that, despite intense anthropogenic impacts on the oceans, the majority of demersal marine fish communities do not follow the global homogenization paradigm common in other realms.

Keywords: Marine biodiversity, biotic homogenization, fish communities, beta diversity.