

The thermophilization of Arctic marine ecosystems from climate change

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One of the most pervasive and widespread signatures of anthropogenic climate change is the global redistribution of biodiversity with an overarching pattern of species range shifts towards cooler environments found at higher latitudes (Poloczanska et al. 2016). As a result, temperate and high-latitude ecosystems are experiencing an influx of warm-affinity, climate migrants that are gradually dominating and replacing the local, cold-affinity flora and fauna. This global thermophilization is well documented in marine ecosystems (e.g., Burrows et al. 2019), characterized by less fragmented habitats and hosting species having typically lower thermal safety margins than terrestrial ecosystems, particularly at biogeographical transition zones where species live at or close to their distributional range limits (Ferro and Morrone 2014). Among them, marginal Arctic seas are particularly exposed and sensitive to the effects of a rapidly warming climate. Here, I review recent evidence on the ongoing thermophilization of marginal Arctic seas, and the resulting consequences ranging from documented shifts in species ranges, to changes in community composition, functional diversity, food webs and, ultimately, ecosystem functioning (e.g., Alabia et al. 2018; Fossheim et al. 2015; Kortsch et al. 2015; Emblemsvåg et al. 2022). As gateways of the Arctic, connecting the Pacific and Atlantic Oceans to the Arctic Ocean, these ongoing changes provide a glimpse into the transformations that are likely to spread into other Arctic marine ecosystems in the future.

References

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