

Seagrasses will benefit from global change

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Researchers show that seagrasses will benefit from increases in the temperature and CO₂ in the oceans because their capacity to acquire nitrogen will be enhanced, not limiting their growth.

"In this study, we demonstrate that [ocean warming](#) increases the nitrogen

demand of a globally distributed seagrass, *Z. marina*, and that this demand may be met by an increasing uptake of organic nitrogen," reveals Ana Alexandre, a seagrass ecologist from the Centre of Marine Sciences (CCMAR) who led the research. The study, now published in *Functional Ecology*, resulted from a collaboration between scientists from CCMAR and Bangor University and contains relevant conclusions about the effects of global change, and particularly ocean warming, on a marine organism.

The teams used an innovative approach that combined field observations of the rates of nitrogen acquisition by the seagrass in three sites along its latitudinal range (Iceland, United Kingdom and Portugal) with the species' acquisition responses to temperature manipulation obtained from laboratory experiments.

"Seagrasses typically show a preference for [inorganic nitrogen](#), usually ammonium, but it was not yet known how this preference would shift with temperature," explains Ana Alexandre. The author adds that "The rationale behind this shift was that the rate of regeneration of inorganic nitrogen through microbial processes is expected to be higher in warmer environments while the availability of organic nitrogen is expected to be lower."

According to Paul Hill from Bangor University's School of Natural Sciences, the results now published "indicate that warming increases the total acquisition of nitrogen by the seagrass, as well as the relative contribution of organic nitrogen to the plant's total nitrogen acquisition. Because the uptake of organic nitrogen by microbes also increases with temperature, warming will potentially enhance the competition for this nitrogen source between the seagrass and its microbial communities."

Seagrasses play a key role in nutrient recirculation in coastal ecosystems. This study shows that oceans' warming increases the capacity of

seagrasses to capture [nitrogen](#), contributing to maintenance of water quality and biodiversity, and increasing the potential for [carbon capture](#).

More information: Ana Alexandre et al. Ocean warming increases the nitrogen demand and the uptake of organic nitrogen of the globally distributed seagrass *Zostera marina*, *Functional Ecology* (2020). [DOI: 10.1111/1365-2435.13576](#)

Provided by Bangor University

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