

Changes in ocean ecosystem associated with anthropogenic climate change

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The impact of anthropogenic climate change on the oceans is becoming increasingly evident. To date, rising temperatures and ocean acidification have progressed, and the biological impacts of climate change, such as coral bleaching, have been confirmed. Oceanic primary production, which was thought to be declining due to climate change until recently, is now often cited as potentially increasing, thanks to recent advances in numerical modeling, leading to a widening divergence of opinions among researchers. Furthermore, the ecological impacts of marine heatwaves, which have been reported more frequently in recent years, are only just beginning to be understood. Near the coast of Japan, for example, the extreme northward shift of the Kuroshio Extension from 2023 to 2024 caused a significant marine heatwave, which had a major impact on the fishing industry. Many questions remain unanswered: Is this northward shift a temporary phenomenon, or will it become more frequent in the long term due to climate change? What ecological impacts would occur if its frequency were to increase? In recent years, enriched climate change projection datasets have made it possible to address these issues. This presentation will provide an overview of our current recognition of ocean ecosystems and outline the key challenges facing us in the future.

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