

Forecasts may help protect marine life a year in advance

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Marine management tools could be used to help avoid whale

entanglements or sea turtle bycatch up to a year in advance, suggests a [Nature Communications](#) paper. The findings demonstrate that these tools (which already exist) could be used to forewarn of ecosystem conditions during climate extremes, similar to forecasting the weather.

Climate change is disrupting ecosystems and [human society](#) at a global scale, and ecological forecasts are urgently needed to support resource management and decision-making. For example, advances in Earth-system models can help predict how climate variations will affect [marine ecosystems](#), which can be used to anticipate and reduce the impact on fisheries. However, current applications of ecological forecasts are still limited.

Stephanie Brodie and colleagues demonstrate the capacity of ecological forecasts to forewarn human–wildlife interactions caused by [climate extremes](#). They used management tools already in use in the California Current Ecosystem that can identify when cooler waters used by whales, such as [humpback whales](#), are pushed towards the coast, putting the whales at risk of entanglement in crab fishing gear. These tools can also identify when drift gillnet fishing should be closed to avoid loggerhead sea turtle bycatch, which is also based on temperature anomalies.

The authors show how these tools can be transitioned to a forecasting system to provide skillful forecasts up to 12 months in advance. They also demonstrate how global forecasts with relatively low resolution could be useful, without the need to downscale to regions. This could allow their application in areas that might lack the resources needed to downscale models, such as in developing nations.

The authors say that advanced warning of potential threats is key to developing proactive management strategies that can help to reduce uncertainty in the face of global change challenges. These approaches could be expanded to many coastal ecosystems worldwide to help

improve global marine resource management, the authors suggest.

More information: Stephanie Brodie et al, Ecological forecasts for marine resource management during climate extremes, *Nature Communications* (2023). [DOI: 10.1038/s41467-023-43188-0](https://doi.org/10.1038/s41467-023-43188-0)

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