

# Climate change restricts migrant species access to oceans

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(Phys.org) —Climate change has led to more than a third of the world's oceans becoming inaccessible to species that migrate seeking favourable climates.

This is the finding of an international team of researchers including Winthrop Professor Carlos Duarte, Director of The University of Western Australia's Oceans Institute.

The team analysed the planet's land and ocean climates over 50 years and mapped ocean and land areas in terms of their role as corridor, sinks or sources of [species](#) migrating in search of favourable [climatic conditions](#) as a result of [climate](#) change, arguably the biggest threat to biodiversity

this century. The study 'Geographical limits to species-range shifts are suggested by climate velocity' has been published in *Nature*.

Marine species including mammals, fish and birds, migrate for various reasons: feeding, mating, birthing, nesting, changing ocean or climate conditions and avoiding human-generated threats such as overfishing, boat strikes and pollution including noise pollution. Some species migrate over tens of thousands of kilometres.

The scientists used the global distribution of the speed of climate change to work out the location, or trajectories, of climatic niches from 1960 and projected up to 2100. They used the properties of these trajectories to infer changes in species distribution and to suggest areas of potential loss of species richness.

They identified areas of climate source - where new conditions are generated - and areas of climate sink, where local climate conditions disappear, potentially blocking the movement of climate migrants; as well as climatic corridors, as the location species migrating in search of favourable climatic conditions will follow. Coastlines, particularly those with east to west orientation, such as the southern coast of Australia, act as climate sinks for land and [marine species](#).

Their work provides a quick and comprehensive method to quantify and map patterns of [climate change](#) and predict which regions of the planet could be most at risk from its effects.

Based on their analysis, the scientists suggested it would be possible to design corridors on land and in the ocean that would enable migration and to anticipate changes in climatic conditions so that existing protected areas could be redeployed and migratory routes could be protected to allow adaptation, through migration, of species to shifting climatic conditions.

**More information:** "Geographical limits to species-range shifts are suggested by climate velocity." Michael T. Burrows, David S. Schoeman, Anthony J. Richardson, et al. *Nature* (2014) [DOI: 10.1038/nature12976](https://doi.org/10.1038/nature12976)

Provided by University of Western Australia

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