

Impacts of climate change on marine mammals around the UK (MCCIP Review 2023)



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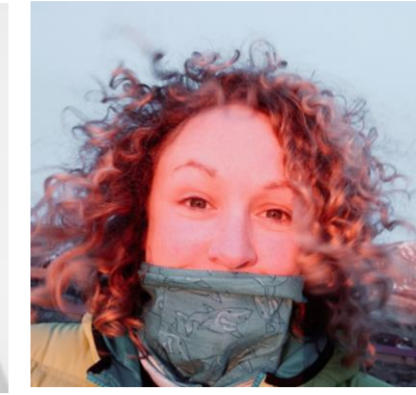
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What is happening?

Geographic range shifts: evidence from stranding records around the UK suggest that the proportion of species which generally favour warmer water is increasing in norther regions previously dominated by colder water species.

Changes in food webs: environmental change is causing impacts on the timing, strength and length of summer stratification and corresponding plankton blooms. This is impacting on species throughout the food web, including key prey species for marine mammals.

Changes in species interactions: geographic range shifts and changing food webs is impacting on species interactions including changes in inter-specific competition and risk effects.



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What could happen?

Continued geographic range shifts: range shifts are expected to continued, and changes in range as direct consequence of changing sea surface temperature may increase. Increasing temperatures are also likely to put baleen whale breeding grounds at risk or result in changes in the timing of migrations.

Changes in ecosystem services: cetaceans play a key role in maintaining normal ecosystem functioning and changes in their use of the marine environment may result in large scale declines in ecosystem health.

Increased prevalence of disease: there are several mechanisms by which the prevalence of disease is expected to increase (e.g., range shifts introducing novel pathogens, thermal stress, more favourable conditions for pathogens). This is likely to be exacerbated by increased occurrence of harmful algal blooms.

Consequences to reproduction: when faced with insufficient resources, individuals are required to trade-off between survival and reproduction. This may lead to skipped breeding attempts, delayed sexual maturation, early-term abortions or less investment in the foetus.

Key challenges

Long term monitoring: more frequent wide-scale data collection alongside the collation of other data sources from around the UK is needed to improve confidence in understanding the impacts of climate change on marine mammal populations.

Cumulative effects: there is an increasing number of marine renewable developments to combat climate change which, when combined with natural physical changes, will create cumulative effects on marine ecosystems. These need to be properly accounted for in ecological models to fully understand how marine mammals will react to climate change.

Bottom-up changes: a better understanding of how marine mammals respond to changes in prey availability is needed e.g. through development of analytical models to include prey energy densities and predator energy requirements.

For more information and references:
Martin, E., Banga, R. and Taylor, N.L. Climate change impacts on marine mammals around the UK and Ireland. MCCIP Science Review 2023, 22pp.

Confidence assessment

What is happening?

Level of agreement/ consensus	H			
	M		X	
	L			
		L	M	H
		Amount of evidence		

What is already happening?

Level of agreement/ consensus	H			
	M		X	
	L			
		L	M	H
		Amount of evidence		

- Evidence of range shifts has increased since the last report alongside more reports noting increasing occurrence of disease or novel diseases and fatal poisonings from HABs.
- More work is needed to understand the impacts of environmental variables beyond temperature, to better understand the variability in responses of both hosts and pathogens and to distinguish the impacts of climate change from other pressures in the environment.



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