Humpback whales impacted by climate change

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Humpback whale cow and calf in the Gulf of St Lawrence, Canada. Credit: Dr Christian Ramp (MICS)

The breeding success of humpback whales in the Gulf of St Lawrence has fallen significantly, according to a new study led by the University of St Andrews.

Widespread, major changes have been documented in the world's oceans over the last decades as a result of climate change. How these large-scale changes will affect populations of top marine predators, including whales for example, is largely unknown.

Researchers Dr. Joanna Kershaw, Professor Patrick Miller and Professor Ailsa Hall of the Sea Mammal Research Unit (SMRU) at the University of St Andrews collaborated with colleagues at the Mingan Island Cetacean Study (MICS) and the Department of Fisheries and Oceans in Canada, to investigate if environmental shifts measured in the Gulf of St Lawrence, an important summer feeding ground for humpback whales, could be affecting their breeding.

Using a combination of blubber biopsy samples to identify pregnant females, and sightings records of individual females collected by MICS, the research team investigated variation in breeding success between 2004 and 2018.

The research, published in *Global Change Biology*, found that calving rates have declined significantly over the study period. In addition, the probability of sighting females with calves was correlated with favorable environmental conditions in the previous year, specifically with the abundance of herring, one of their main prey species.

It had been previously thought that baleen whales could potentially show some resilience to climate change because of their ability to alter their migratory patterns, or switch prey species. This research shows that their ability to respond in these ways may not be enough to prevent their reproductive success from being impacted by ecosystem change.

Lead author of the study Dr. Joanna Kershaw, of SMRU at the University of St Andrews, said: "Long term monitoring efforts, and inter-disciplinary collaborations like these are vital to assess how marine

mammals, and other marine species, may be impacted by climate change now and into the future."

Dr. Carol Sparling, Director of the Sea Mammal Research Unit at the University of St Andrews, said: "This is an important study that provides evidence that breeding success is linked to prey availability and that large whale species such as humpbacks may be more vulnerable to climate change than previously thought."

More information: Joanna L. Kershaw et al. Declining reproductive success in the Gulf of St. Lawrence's humpback whales (Megaptera novaeangliae) reflects ecosystem shifts on their feeding grounds, *Global Change Biology* (2020). DOI: 10.1111/gcb.15466

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