

Tufted puffin reproduction reveals ocean climate variability

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Anomalously warm sea-surface temperatures (SSTs) are associated with interannual and decadal variability as well as with long-term climate changes indicative of global warming. Such oscillations could precipitate changes in a variety of oceanic processes to affect marine species worldwide. As global temperatures continue to rise, it will be critically important to be able to predict the effects of such changes on species' abundance, distribution, and ecological relationships so as to identify vulnerable populations. Off the coast of British Columbia, warm SSTs have persisted through the last two decades. Based on 16 years of reproductive data collected between 1975 and 2002, we show that the extreme variation in reproductive performance exhibited by tufted puffins (*Fratercula cirrhata*) was related to changes in SST both within and among seasons. Especially warm SSTs corresponded with drastically decreased growth rates and fledging success of puffin nestlings. Puffins may partially compensate for within-season changes associated with SST by adjusting their breeding phenology, yet our data also suggest that they are highly vulnerable to the effects of climate change at this site and may serve as a valuable indicator of biological change in the North Pacific. Further and prolonged increases in ocean temperature could make Triangle Island, which contains the largest tufted puffin colony in Canada, unsuitable as a breeding site for this species.

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