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Citation	The 51st Annual Meeting of the Association for Tropical Biology and Conservation (ATBC 2014), Cairns, Australia, 20-24 July 2014.
Issued Date	2014
URL	http://hdl.handle.net/10722/201720
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THE IMPORTANCE OF CHANGING CLIMATIC VARIABILITY FOR TROPICAL WILDLIFE POPULATION GROWTH RATES

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Much interest in the population impact of climate change has focused on the widespread increases in mean temperature, but little attention has been paid to the less homogeneous and less predictable changes in temperature variability. Well-established demographic theories have long pointed to a potential impact of environmental variability on population growth rates, but these have rarely been tested in practice, and the limited evidence available has suggested only minor effects. Using long-term data on tropical bird populations, we demonstrate that the prevailing levels of temperature variability are large enough to have a major impact; reducing population growth rates by up to half of what could be achieved under constant conditions. We demonstrate not only that the variability can fluctuate substantially from year to year, but that long-term trends exist, and that these can drive important change in the dynamics of wildlife populations. Over the last century, although our study populations have been exposed to increasing mean temperatures, some regions have also shown a decrease in variability. Our models indicate that temperature variability is at least as important as the mean temperature, and where variability has decreased, it is large enough to offset some effect of the rising mean. Overall, our study shows that the demography of wildlife populations can be driven by climatic variability and we recommend greater attention be paid towards climate variability and its impact on wildlife populations.