



Current hiatus of global warming tied to equatorial Pacific surface cooling

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Despite the continued increase of atmospheric greenhouse gases, the annual-mean global temperature has not risen in this century, challenging the prevailing view that anthropogenic forcing causes climate warming. Two schools of idea exist regarding what causes this hiatus in global warming: one suggests a slowdown in radiative forcing due to the stratospheric water vapour, the rapid increase of aerosols, and the solar minimum around 2009, while the other considers the hiatus as part of internal variability, especially a La Niña-like cooling in the tropical Pacific. We present a method to unravel mechanisms for global temperature change by prescribing the observed history of sea surface temperature over the deep tropical Pacific (8.2% of Earth's surface) in a coupled climate model, in addition to radiative forcing. Our model reproduces the annual-mean global temperature remarkably well with a correlation coefficient of 0.97 for 1970-2012, a period including the current hiatus and an accelerated global warming from the 1970s to the late 1990s. Moreover, our simulation captures major seasonal and regional characteristics of the hiatus, including the intensified Walker circulation, weakening of Aleutian Low, the winter cooling in northwestern North America and prolonged drought in the southern US. Our results show that the current hiatus is part of natural climate variability, tied specifically to a La Niña-like decadal cooling. While similar decadal hiatus events may occur in the future, multi-decadal warming trend is very likely to continue with greenhouse gas increase.