Global warming slowdown probably due to natural cycles, study finds

26/02/2015

Manmade global warming over the past decade has probably been partly offset by the cooling effect of natural variability in the Earth's climate system, a team of climate researchers have concluded.

The finding could help explain the slowdown in temperature rises this century that climate sceptics have seized on as evidence climate change has stopped, even though 14 of the 15 hottest years on record have happened since 2000.

The authors of the new paper describe the slowdown, sometimes called a global warming hiatus or pause, as a "false pause". They warn that the natural cycles in the Pacific and Atlantic that they found are currently having an overall cooling effect on temperatures will reverse in the coming decades – at which point warming will accelerate again.

"It [the new paper] has important implications for understanding the slowdown," said Byron A Steinman, the lead author of the study, which was published in the journal Science on Thursday.

"I think probably the biggest thing that people should understand is there is randomness in the climate system. The recent slowdown in no way invalidates the idea that continued burning of fossil fuels will increase Earth's surface temperature and pose a substantial burdens on human society," Steinman told the Guardian.

"The slowdown in no way invalidates that the burning of fossil fuels will increase Earth's surface temperature", Byron A Steinman, lead author of the study

The research looked at two long-term climate phenomenon that play a key role in global temperatures, the Pacific Decadal Oscillation and the Atlantic Multidecadal Oscillation. The authors worked to strip out 'external forces' on those oscillations, such as volcanoes and the burning of fossil fuels, to work out how much they varied naturally, or internally.

Such natural variability is likely to have had a substantial influence over the span of several decades on temperatures in the northern hemisphere, they concluded, of up to 0.15C in a warming or cooling effect – and in recent years it has been a cooling one.

"We find that internal multidecadal variability in northern hemisphere temperatures, rather than having contributed to recent warming, likely offset anthropogenic warming over the past decade," the authors write.

Michael E Mann, one of the co-authors, blogged that: "Our conclusion that natural cooling in the Pacific is a principal contributor to the recent slowdown in large-scale warming is consistent with some other recent studies, including a study I commented on previously showing that stronger-than-normal winds in the tropical Pacific during the past decade have lead to increased upwelling of cold deep water in the eastern equatorial Pacific".

Steinman said the new work was a substantial step forward and employed state-of-the-art climate models that previous studies on the subject had not used.

But the paper warned that the natural cycles are likely to reverse in coming years, adding to manmade warming in the coming decades. "When that trend reverses, that will then add to warming, so warming will accelerate," said Steinman. He added that it was difficult to say exactly when in the next few decades that would happen.

Mann wrote on the RealClimate blog that such an acceleration "is perhaps the most worrying implication of our study, for it implies that the 'false pause' may simply have been a cause for false complacency, when it comes to averting dangerous climate change".

Ben Booth, a scientist at the Met Office who was not involved in the study, said that the new work provided a more nuanced picture of the role natural cycles play in the climate. "What this result shows is that on a decadal time scale, the variability in the oceans can have an important role to play in dampening warming," he told the Guardian.

"The results support the conclusion that cool Pacific temperatures have played a key role in modulating atmospheric temperature increases in the past 10 years, only partially offset by modest warming in the Atlantic," he wrote in a commentary also published in Science.