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# What to Make of a Warming Plateau



Rungroj Yongrit/Agence France-Presse

A storm gathered over Bangkok. Despite a recent lull, climate scientists say it is an open question whether the pace of warming has undergone any lasting shift.

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As unlikely as this may sound, we have lucked out in recent years when it comes to [global warming](#).

The rise in the surface temperature of earth has been markedly slower over the last 15 years

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than in the 20 years before that. And that lull in warming has occurred even as greenhouse gases have accumulated in the atmosphere at a record pace.

The slowdown is a bit of a mystery to climate scientists. True, the basic theory that predicts a warming of the planet in response to human emissions does not suggest that warming should be smooth and continuous. To the contrary, in a climate system still dominated by natural variability, there is every reason to think the warming will proceed in fits and starts.

But given how much is riding on the scientific forecast, the practitioners of climate science would like to understand exactly what is going on. They admit that they do not, even though some potential mechanisms of the slowdown have been suggested. The situation highlights important gaps in our knowledge of the climate system, some of which cannot be closed until we get better measurements from high in space and from deep in the ocean.

As you might imagine, those dismissive of climate-change concerns have made much of this warming plateau. They typically argue that "global warming stopped 15 years ago" or some similar statement, and then assert that this

disproves the whole notion that greenhouse gases are causing warming.

Rarely do they mention that most of the warmest years in the historical record have occurred recently. Moreover, their claim depends on careful selection of the starting and ending points. The starting point is almost always 1998, a particularly warm year because of a strong [El Niño](#) weather pattern.

Somebody who wanted to sell you gold coins as an investment could make the same kind of argument about the futility of putting your retirement funds into the stock market. If he picked the start date and the end date carefully enough, the gold salesman could make it look like the stock market did not go up for a decade or longer.

But that does not really tell you what your retirement money is going to do in the market over 30 or 40 years. It does not even tell you how you would have done over the cherry-picked decade, which would have depended on exactly when you got in and out of the market.

Scientists and statisticians reject this sort of selective use of numbers, and when they calculate the long-term temperature trends for the earth, they conclude that it continues to warm through time. Despite the recent lull, it is an open question whether the pace of that warming has undergone any lasting shift.

What to make of it all?

We certainly cannot conclude, as some people want to, that carbon dioxide is not actually a greenhouse gas. More than a century of research thoroughly disproves that claim.

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In fact, scientists can calculate how much extra heat should be accumulating from the human-caused increases in greenhouse gases, and the energies involved are staggering. By a conservative estimate, current concentrations are [trapping an extra amount of energy](#) equivalent to 400,000 Hiroshima bombs exploding across the face of the earth every day.

So the real question is where all that heat is going, if not to warm the surface. And a prime suspect is the deep ocean. Our measurements there are not good enough to confirm it absolutely, but a growing body of research suggests this may be an important part of the answer.

Exactly why the ocean would have started to draw down extra heat in recent years is a mystery, and one we badly need to understand. But the main ideas have to do with possible shifts in winds and currents that are causing surface heat to be pulled down faster than before.

The deep-ocean theory is one of a half-dozen explanations that have been proffered for the warming plateau. Perhaps the answer will turn out to be some mix of all of them. And in any event, computer forecasts of climate change suggest that pauses in warming lasting a couple of decades should not surprise us.

Now, here is a crucial piece of background: It turns out we had an earlier plateau in global warming, from roughly the 1950s to the 1970s, and scientists do not fully understand that one either. A lot of evidence suggests that sunlight-blocking pollution from dirty factories may have played a role, as did natural variability in ocean circulation. The pollution was ultimately reduced by stronger clean-air laws in the West.

Today, factory pollution from China and other developing countries could be playing a similar role in blocking some sunlight. We will not know for sure until we send up satellites that can make better measurements of particles in the air.

What happened when the mid-20th-century lull came to an end? You guessed it: an extremely rapid warming of the planet.

So, if past is prologue, this current plateau will end at some point, too, and a new era of rapid global warming will begin. That will put extra energy and moisture into the atmosphere that can fuel weather extremes, like heat waves and torrential rains.

We might one day find ourselves looking back on the crazy weather of the 2010s with a deep yearning for those halcyon days.

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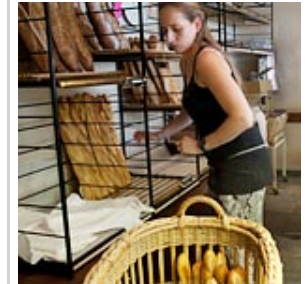
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