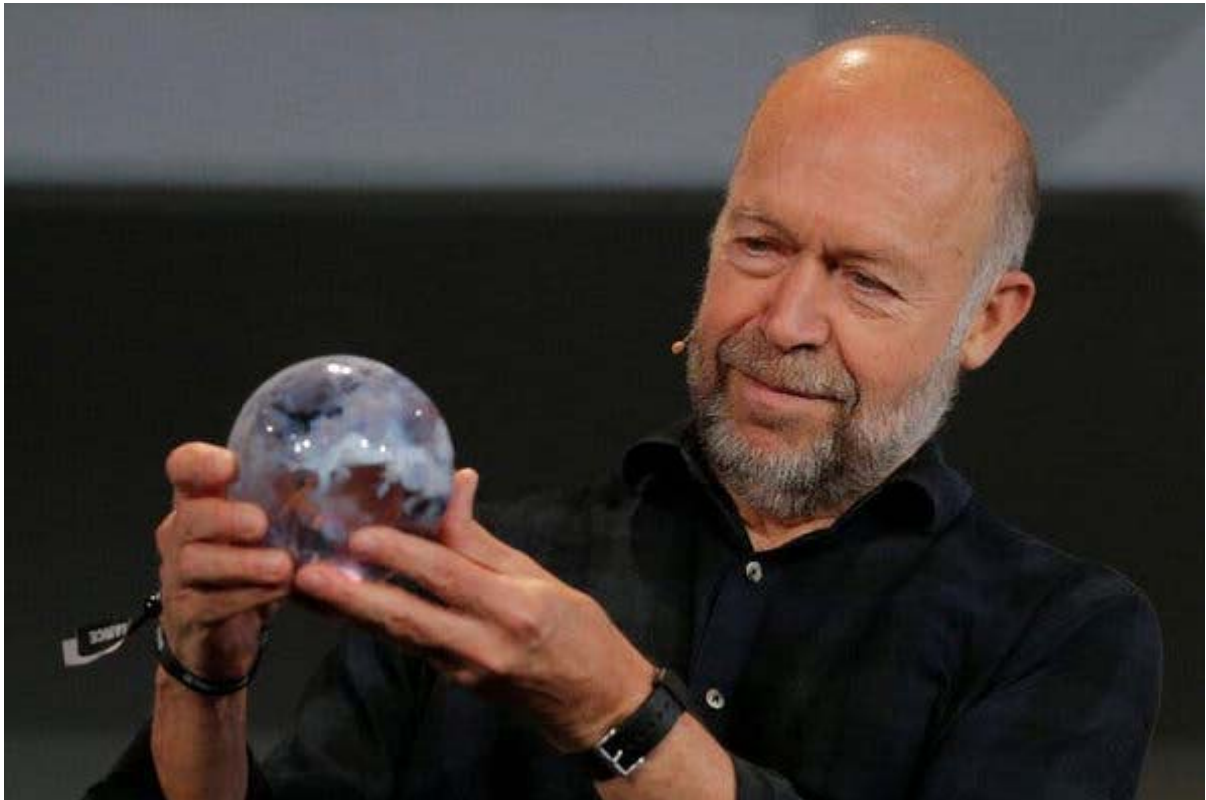


35 Years After Addressing Congress, James Hansen Has More Climate Warnings

The former NASA scientist James Hansen says in a new paper that global temperatures will pass a major milestone this decade, faster than other estimates predict.

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James Hansen in 2017. “The 1.5 degree limit is deader than a doornail,” he said recently. Credit...Brian Snyder/Reuters



By Delger Erdenesanaa

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Climate Forward There's an ongoing crisis — and tons of news. Our newsletter keeps you up to date. [Get it in your inbox.](#)

Global warming may be happening more quickly than previously thought, according to a new study by a group of researchers including former NASA scientist James Hansen, whose [testimony before Congress 35 years ago](#) helped raise broad awareness of climate change.

The study warns that the planet could exceed 1.5 degrees Celsius, or 2.7 degrees Fahrenheit, of warming [this decade](#), compared with the average temperature in preindustrial days, and that the world will warm by 2 degrees Celsius by 2050. When countries signed the landmark Paris Agreement in 2015 to collectively fight climate change, they agreed to try and limit global warming to “well below” 2 degrees Celsius and aim for 1.5 degrees.

“The 1.5 degree limit is deader than a doornail,” said Dr. Hansen, now the director of the Climate Science, Awareness and Solutions Program at Columbia University, during a news conference on Thursday. The 2 degrees goal could still be met, he said, but only with concerted action to stop using fossil fuels and at a pace far quicker than current plans.

The world has warmed by about 1.2 degrees Celsius so far and is already experiencing worsening heat waves, wildfires, storms, biodiversity loss and other consequences of climate change. Past the Paris Agreement temperature goals, which reflect the results of international diplomacy rather than exact scientific benchmarks, the effects will get significantly worse and veer into territory with greater extremes and unknowns.

Experts generally don't quibble over the finding that the planet will soon pass 1.5 degrees of warming. A [separate study published on Monday](#) by British and Austrian scientists similarly found that, at our current rate of burning fossil fuels, the world would be committed to passing 1.5 degrees of warming within six years.

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Air-conditioning use. Sixty nations in Dubai for [U.N. climate talks](#) committed to [improve the efficiency of new air-conditioners by 50%](#) and reduce greenhouse gas emissions related to those cooling machines by almost 70%, the latest in a flurry of global promises that aim to tackle climate change.

Whale entanglements. Scientists [can now use climate models](#) to predict up to a year in advance when hot ocean temperatures will raise the risk of tangles between whales and fishing equipment that endanger the animals' lives. Warmer water squeezes cooler water preferred by whales and their prey close to shore, where fishermen set their traps.

Rising emissions. The greenhouse gas emissions that are warming the planet [are on the rise](#), despite years of commitments by countries to reduce them. Carbon dioxide released from burning fossil fuels is expected to grow by 1.1% in 2023 compared with 2022, researchers from the Global Carbon Project found.

Malaria. The W.H.O. said that there were an estimated 249 million cases of malaria around the globe in 2022, an increase of five million over 2021. Those new cases were concentrated in five countries, and [climate change was a direct contributor in three of them](#).

A sober assessment. The world's nations are taking more concrete steps to tackle climate change than ever before, but [they are still very far from making the sweeping changes needed](#) to keep global temperatures at relatively safe levels, according to a new U.N. report.

“I think everyone agrees that 1.5 degrees is in the rearview mirror at this point,” said Zeke Hausfather, a research scientist at Berkeley Earth.

What Dr. Hausfather and others disagree with is the Hansen team's estimate of just how sensitive the Earth's climate is to greenhouse gases, and accordingly, how soon the world might pass 2 degrees of warming.

The new study analyzed reconstructed temperatures and carbon dioxide levels over the past 66 million years, using evidence from other recent papers, to calculate a numerical relationship between carbon dioxide and temperature. Global warming is being driven by the burning of fossil fuels, which releases greenhouse gases like carbon dioxide into the atmosphere, where it traps the sun's heat, warming the planet.

The researchers found that if the amount of carbon dioxide in the atmosphere is doubled, the planet will warm by somewhere between 3.6 and 5 degrees Celsius.

Editors' Picks

“That is very much on the high end of the range of estimates that are in the academic literature today,” Dr. Hausfather said.

A 2021 report from the [Intergovernmental Panel on Climate Change](#), which Dr. Hausfather contributed to, estimated that doubling carbon dioxide from preindustrial levels would result in warming between 2 and 5 degrees Celsius, mostly likely around 3 degrees. The IPCC report combined many different estimates that scientists have arrived at using various methods, including climate models, historical data and reconstructions of Earth's distant past.

So far, humans have increased the amount of carbon dioxide in the atmosphere by about 50 percent, from 280 parts per million in the 1700s to 417 parts per million in 2022 — resulting in a relatively linear temperature increase over time. But Dr. Hansen believes warming is accelerating.

One reason, he said, is a successful reduction in sulfate aerosols in the atmosphere as countries and industries, especially shipping, have cracked down on air pollution in recent years. Different pollutants have different effects in the atmosphere. Sulfate aerosols, another byproduct of burning fossil fuels, reflect sunlight away from the surface of the Earth and help cool the planet slightly.

[Window for Meeting Key Climate Goal Is Even Narrower Than Thought](#)

Other prominent climate scientists, including Michael Mann at the University of Pennsylvania, who [published a rebuttal of the new study](#), disagree that climate change is accelerating.

Despite these disagreements, the very real, physical deadlines of 1.5 and 2 degrees Celsius are looming close enough on the horizon that, to a certain extent, exactly how sensitive the Earth's climate is to future greenhouse gas emissions doesn't matter. Most experts agree that while the 1.5 degree goal has already been missed, 2 degrees is still salvageable — but not without much more action than countries are currently taking.

“We're also going to pass 2 degrees. That's clear, unless we take action to reduce the energy imbalance,” Dr. Hansen said. “The first thing we must do is reduce emissions as fast as possible.”