

Post-printing additions to the book, *The Science of Global Warming*

So many new things relevant to this book kept coming up that I have initiated this service to cover them. I will divide the reports by season, i.e. Fall, Winter, Spring and Summer, by month, equinox and solstice)

- **Fall (Autumn):** September (22nd), October, November
- **Winter:** December (21), January, February
- **Spring:** March (20th), April, May
- **Summer:** June (21st), July, August

SPRING

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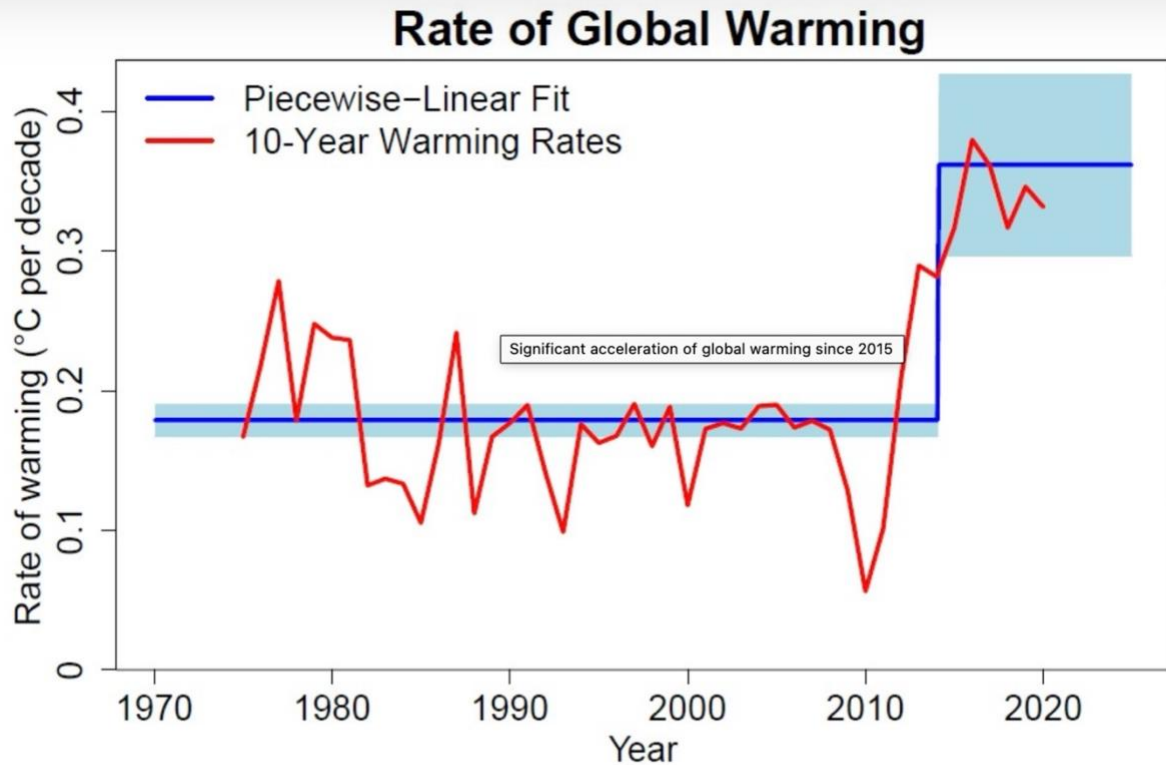
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1. Global warming has accelerated significantly.

Foster, G., & Rahmstorf, S. (2026). Global warming has accelerated significantly. *Geophysical Research Letters*, 53, e2025GL118804. <https://doi.org/10.1029/2025GL118804>

Recent record-hot years have caused discussion over whether global warming has accelerated. Previous analysis found acceleration (i.e., increase in warming rate) has not yet reached a 95% confidence level, given natural temperature variability. We remove the estimated influence of three main natural variability factors: El Niño, volcanism, and solar variation. The resulting adjusted and thus less “noisy” data show that there has been acceleration with over 98% confidence, with faster warming over the last 10+ years than during any previous decade.



Global warming rate (in °C per decade) from the Berkeley Earth global temperature data: The blue line shows the linear trends for the time before and after 2015 (light blue the uncertainty range). The red line shows the linear trend for 10-year windows of the data, at 1-year intervals. Figure: PIK

2. Can Species Evolve Fast Enough to Survive Global Warming?

New Scientist March 29, 2026. Page, M. Can species evolve fast enough to survive as the planet heats up?

A wildflower, Scarlet Monkey Flower (*Mimulus cardinalis*) that adapted to severe drought has raised hopes that rapid evolution will rescue species hit by global warming. It is a water loving plant that adapted to survive severe drought. Those that survived evolved drought resistance in 3 years. They had many mutations in a part of their genome linked to climate adaptations. Study was by Daniel Ansett at Cornell University.

3. Money better spent combating Global Warming than Humans Going to Mars.

I cringe every time I hear Musk or the President talk about going to Mars. The reason I cringe is that it would be hugely expensive and that money would be better spent combating global warming. Fix our planet before going to another. In addition, there is little humans can learn that cannot be learned by robots and we have already had robots on Mars for many months.

4. Abrupt Gulf Stream path changes are a precursor to a collapse of the AMOC.

The Gulf Stream is part of the Atlantic Meridional Overturning Circulation (AMOC). The authors investigated the link between the AMOC and Gulf Stream using a high-resolution (0.1°) stand-alone ocean simulation, in which the AMOC collapses under a slowly increasing freshwater forcing. AMOC weakening gradually shifts the Gulf Stream near Cape Hatteras northward, followed by an abrupt northward displacement of 219 km within 2 years. These findings provide indirect evidence for present-day AMOC weakening and demonstrate that abrupt Gulf Stream shifts can serve as early warning indicator for AMOC tipping.

Reference

van Westen, R.M. and Dijkstra, H.A., 2026. Abrupt Gulf Stream path changes are a precursor to a collapse of the Atlantic Meridional Overturning Circulation. *Communications Earth & Environment*, 7: p. 197.

5. President Trump's War on Wind, has reached an absurd new low

said Paul Krugman, Nobel Prize winning economist. Under a deal reached last week, the administration “will pay Total Energies, a French Energy giant, almost 1 billion dollars, not to produce energy.” That right, the U.S. taxpayers are effectively bribing Total Energies to give up leases to develop two offshore wind farms, even as we are engulfed in a “global fuel crisis” caused by the Iran war.

Renewable energy (solar and wind) is now cheaper than coal and oil and is not vulnerable to global price swings.

Trump has irrationally hated wind turbines ever since two were built within sight of his golf course in Scotland.

Trump threatened to cut Medicare to pay for the war with Iran when a billion could be saved by canceling this insanity. It is hard to imagine a more ill-advised policy.

Reference: THE WEEK April 10, 2026, p 12

6. Trump misfires with 2027 budget

By Michael Hiltzik April 12, 2026, LA Times.

The Trump administration's budget proposal for the 2027 fiscal year, seems designed to set a new standard for partisan ideology as a spending standard.

- **42% increase in defense spending.**
- **scientific programs, such as those concerned with global warming** or the social and economic implications of science, technology and healthcare policies would be **slashed by more than 50%.**
- cut NASA's science division by \$34 billion, or 47%, canceling more than 40 projects, of which about 20 are currently underway.
- The proposed **cuts to science programs** more generally would be devastating. The National Science Foundation, one of the most important scientific grant-making agencies in the world, would lose \$4.8 billion, or 55% of its funding.
- \$8.5 billion in proposed budget cuts to K-12 spending.
- Aimed at research, development and construction of renewable energy sources. The budget plan contains no fewer than **20 references to what it calls the "green new scam."**
- **More development of fossil sources**, including a revival of coal
- **Put a stop to disastrous offshore wind energy** projects that "harm hardworking coastal communities, precious wildlife, and American military readiness." None of these assertions about wind power is supported by reality.
- The **National Institutes of Health**, a consistent target of conservative budget-cutters, would lose **\$5.9 billion, or 12.5% of its budget.**
- **Need to protect our wealthiest taxpayers** from, well, taxes. The budget would cut \$1.4 billion from the budget of the Internal Revenue Service, reversing a restoration of the agency's enforcement capabilities undertaken during the Biden administration. Trump cut IRS staffing by 20,000, or 27%. The document asserts that the IRS "has been weaponized against the American people, small businesses, and non-profit organizations."

- According to the Yale Budget Lab, every dollar the IRS spends on audits yields more than \$7 in returns. Plainly that's not coming from average Americans, but from the upper crust.

7. Trump keeps Coal Plants Operating

By Matthew Brown and Michael Phillis, LA Times April 13, 2026

The Biden administration and many electric utilities were building a future dominated by renewable energy. They aimed to replace coal, slashing greenhouse gases and reducing air pollution that kills more than a thousand people annually.

Dozens of coal plants — emitting as much planet-warming pollution as 27 million cars — were expected to be retired during Trump's second term. Now there may not be any more coal plants closing until after Trump leaves office, according to officials and the energy analysis company Enverus.

The United States is undergoing a dramatic shift in energy policy as Trump wields the government's sweeping powers to **benefit coal and suppress cleaner alternatives**. It could lead to more expensive electricity and dirtier air and set back efforts to curb climate change, according to an Associated Press review of government data and interviews with experts.

Trump officials are using emergency powers to prevent five coal plants from closing. That's raising ratepayer bills: Keeping one Michigan plant open for about seven months cost \$135 million. The administration also is using millions of dollars of taxpayer money to make repairs and extend the lives of other coal plants, while weakening protections against air pollution and, most recently, toxic coal ash.

Interior Secretary Doug Burgum has said the goal for coal plants "is 100% stay open, no more retirements, no more shutting down."

The actions far exceed Trump's coal advocacy in his first term, when he relaxed some environmental regulations to give it a short-lived boost.

The administration contends that coal produces badly needed power even during extreme weather, giving it an advantage over renewables that it says the Biden administration unwisely subsidized in the name of climate change.

“The Trump administration this time around is much more organized and strategic in **trying to bring about a revival of coal**,” said Robert Lifset, a University of Oklahoma professor of energy history. “You’re seeing almost like a whole-of-government approach.”

It’s happening as electricity demand surges due to the colossal growth of data centers. One Indiana community oversaw construction of vast solar fields on farmland ahead of an expected retirement of the Schahfer Generating Station, a coal plant in Wheatfield, Ind. Now the Trump administration is keeping that plant open, saying its power is crucial.

Then in December, **the Trump administration issued an emergency order to keep Schahfer operational, saying its coal-generated power was essential to meet demand from extreme weather.**

Coal plants scheduled to retire under Trump emitted more than 130 million tons of carbon dioxide last year, plus tens of thousands of tons of health-damaging sulfur dioxide and nitrogen oxides.

“If we retire all the coal plants we could avoid those 2,000 deaths per year from coal. And if we keep the plants online and they keep burning coal, then we’re going to get those emissions and see those same health impacts,” said George Mason University environmental engineer Lucas Henneman, who led a government study of deaths from coal pollution.

Modernizing the aging fleet of U.S. coal plants to keep them afloat, make them more affordable and with fewer emissions ultimately could cost \$1 billion annually.

[There have been] legal challenges from five Democratic-led states — Washington, Illinois, Minnesota, Michigan and Colorado.

Economists are skeptical that coal's revival will last. Aging coal plants don't make sense when solar is cheap, said Tufts University associate professor Steve Cicala. No large U.S. coal plant has been built since 2013, although one is planned in Alaska.

Parts of Trump's agenda already have faltered. The largest federal coal lease sale in more than a decade flopped, and courts rejected some of Trump's attempts to block wind power. Yet industry executives remain bullish. **"It's our time,"** said CEO Jimmy Brock with Core Natural Resources, **one of the nation's largest coal mining companies.**

8. China's renewable energy capacity reaches 2,400 gigawatts by March 2026

This provides 60% of that required. Wind and solar contributed 1,900 GW to installed capacity. This compares to 368 GW for wind and solar and 500 GW for all renewables in the U.S. China is putting us to shame.

9. Collapse of AMOC may release tons of CO₂.

New research by Nian et al, (2026) shows that the complete collapse of the AMOC could also emit as much as 640 gigatons of carbon dioxide near Antarctica, heating the planet by an additional 0.2°C.

This collapse could increase atmospheric carbon dioxide by 47–83 ppm carbon dioxide, leading to around 0.2°C of additional global warming. This response originates from deep convection triggered in the Southern Ocean, which ventilates deep carbon-rich waters. The deep water there, which is largely trapped beneath a layer of fresher surface water, has accumulated carbon from the atmosphere as well as from the sinking of dead plankton.

Nian, D., Willeit, M., Wunderling, N. et al. Collapse of the Atlantic meridional overturning circulation would lead to substantial oceanic carbon release and additional global warming. *Commun Earth Environ* (2026). <https://doi.org/10.1038/s43247-026-03427-w>

10 Trump's DOJ swoops in to save Big Oil

Minnesota Attorney General Keith Ellison filed a law suit in 2020 accusing ExxonMobil, Koch Industries, Flint Hills Resources, and the American Petroleum Institute of "deliberately undermining the science of climate change, purposefully

downplaying the role that the purchase and consumption of their products played in causing climate change ... [and] failing to fully inform the consumers and the public of their understanding that without swift action, it would be too late to ward off the devastation.” The lawsuit alleges the oil companies violated Minnesota laws against consumer fraud, false advertising, deceptive trade practices, fraud, misrepresentation, and failure to warn.^{[1][2][3][4][5][6][7][8][9][10][11][12][13][14][15][16][17][18][19][20][21][22][23][24][25][26][27][28][29][30][31][32][33][34][35][36][37][38][39][40][41][42][43][44][45][46][47][48][49][50][51][52][53][54][55][56][57][58][59][60][61][62][63][64][65][66][67][68][69][70][71][72][73][74][75][76][77][78][79][80][81][82][83][84][85][86][87][88][89][90][91][92][93][94][95][96][97][98][99]}As a remedy, Ellison’s lawsuit is seeking money to help cover climate-related costs in Minnesota.

The case has spent the last six years tangled up in procedural purgatory. But last month, the Minnesota Supreme Court declined to take up the oil industry’s latest appeal. The stay in the case dissolved, meaning Minnesota’s lawsuit could finally start moving toward discovery—the juicy part of the legal process where companies may have to turn over internal documents and answer questions under oath.^{[1][2][3][4][5][6][7][8][9][10][11][12][13][14][15][16][17][18][19][20][21][22][23][24][25][26][27][28][29][30][31][32][33][34][35][36][37][38][39][40][41][42][43][44][45][46][47][48][49][50][51][52][53][54][55][56][57][58][59][60][61][62][63][64][65][66][67][68][69][70][71][72][73][74][75][76][77][78][79][80][81][82][83][84][85][86][87][88][89][90][91][92][93][94][95][96][97][98][99]}

Trump’s DOJ swooped in to protect the oil companies, claiming Minnesota’s lawsuit is seeking to “regulate global greenhouse gas emissions,” which falls under federal authority, and therefore must be dismissed. This is not true. The lawsuit says nothing about a change in greenhouse gas regulations. It is about the oil company’s false denial of the existence of greenhouse induced climate change.

Trump was not alone is trying to protect the oil companies.

Republicans Sen. Ted Cruz and Rep. Harriet Hageman, introduced a bill which would make it illegal to sue the fossil fuel industry or any fossil fuel-adjacent company over damages from climate change.

Emily Atkin, Heated

11. Sea levels 1 to 3 feet higher than thought.

Recent studies indicate that sea levels are 1 to 3 feet higher than previously thought.

Minderhoud, P. S. J., Shirzaei, M., & Teatini, P. (2025). From InSAR-derived subsidence to relative sea-level rise—A call for rigor. *Earth's Future*, 13, e2024EF005539. <https://doi.org/10.1029/2024EF005539> Received 6 NOV 2024 Accepted 2 JAN 2025 ©, 2025.

12. Trump administration to pay two more companies to walk away from US offshore wind leases

Jennifer McDermott and Matthew Daly, The Associated Press

The Trump administration has announced two more “payouts” for energy companies – totaling nearly \$900m – to abandon US offshore wind projects under development, according to the Associated Press. It says that Bluepoint Wind and Golden State Wind were developing offshore wind projects in New Jersey, New York and California, but will no longer pursue them. [Bloomberg](#) notes that the “moves come in exchange for plans by the companies to direct hundreds of millions of dollars into US fossil fuel development”. Among the fossil-fuel projects being pursued are liquefied natural gas facilities along the Gulf Coast, according to the [New York Times](#). The [Los Angeles Times](#) explains that the move follows a similar \$1bn deal with TotalEnergies and marks “yet another escalation of President Trump’s efforts to obstruct clean-energy projects in favor of oil, gas and coal”.

13 UK: June heat record smashed again as temperature hits 36.7C

Peter Chappell and Tash Mosheim, The Times

The UK had its “hottest June day” – again – on Thursday (June 2026) when temperatures of 36.7C were recorded in Somerset, reports the Times. It says the new record for the month “beat the high set on Wednesday”, as well as a record set in 1976. It continues that on Wednesday, the UK experienced its warmest June night on record, with temperatures in Cardiff not falling below 23.5C, exceeding the previous record of 22.7C set in 1976. The BBC News notes on its live blog that, yesterday, **England “broke its record twice in one day”, Wales recorded its hottest June day and Scotland and Northern Ireland both recorded their hottest day of the year so far.** The newspaper covers the heat record on its frontpage, where it notes that **more than 1,200 schools are shut.**

Meanwhile, BBC News reports that the London Ambulance Service (LAS) saw its **“highest ever” number of life-threatening emergencies**. Crews responded to a record 642 “category one” calls on Wednesday before the record was broken again yesterday, it says. The Independent quotes LAS chief executive Jason Killens as saying the record had been “driven by the extreme heat”. The Guardian looks at how the extreme heat is affecting hospitals in England, noting that doctors have pointed to **“radiotherapy machines and MRI scanners failing, critical IT systems stalling and cooling units that serve entire hospitals breaking down”**. The hot weather has also prompted a **“surge in admissions and people arriving at A&E, causing severe overcrowding in some places”**, it continues, adding that several NHS trusts have “declared critical incidents”.

14. Brutal nights and humidity mark Europe’s record June temperatures

Kenza Bryan and Steven Bernard, Financial Times.

The Financial Times reports on how the heatwave is unfolding across Europe. It notes that temperatures neared 41C in Paris, where “heat-absorbing zinc rooftops” have caused temperatures in apartment buildings to “soar further”. Some areas of France have seen night-time temperatures of 30C, it continues, adding that “tropical nights” that do not fall below 20C make it harder for the human body to recover from heat stress. France’s prime minister Sébastien Lecornu reportedly told mayors yesterday that financing would “double” for building work on hospitals including protecting them from extreme heat, according to the newspaper. It notes that the “heatwave is moving east across Europe” and is expected to peak in Germany at the weekend at 41C, (105.8F) adding that Austria’s weather agency has warned Vienna could hit a record 40C.

Meanwhile, Euronews reports that France's state-owned energy giant EDF has temporarily shut down two nuclear reactors as a precautionary environmental measure, as the country grapples with a record-breaking heatwave that has “already turned deadly”. Le Monde notes the country is “on track” towards a **“severe summer drought”**. Politico says the heatwave has “thrust climate change to the forefront of the national debate ahead of next year’s presidential election”

and is forcing the far-right National Rally party to “confront its previous efforts to downplay the issue”.

MORE ON EUROPE HEAT

- In a frontpage story, the Financial Times reports that electricity prices are soaring across Europe amid the heatwave.
- Reuters reports on how the European heatwave is driving an air-conditioning sales boom for Asian manufacturers.
- Euractiv: “Record heat tests Europe's healthcare systems.”

15. US transition to renewable energy is continuing despite Trump

This guest post is by:

Dhruv Modi, research analyst, Center for Global Sustainability, University of Maryland, Alicia Zhao, research manager, Center for Global Sustainability, University of Maryland, Tyler Stotland, research analyst, Center for Global Sustainability, University of Maryland, Prof Nate Hultman, director of the Center for Global Sustainability, University of Maryland, and professor in the School of Public Policy, University of Maryland

The current administration has enacted a range of changes to prioritize fossil-fuel energy and environmental deregulation in the US, while withdrawing support for renewables. Yet solar, wind and battery storage **accounted for over 90% of new energy capacity in 2025**. This is thanks to the falling cost of renewable energy technologies, investments spurred by the Inflation Reduction Act and Bipartisan Infrastructure Law and local and state policies. This pace of renewable deployment is attributable to quickly declining costs, driven by improvements in manufacturing technology, maturing supply chains and better economies of scale. Meanwhile, 112GW of coal capacity was retired over the last decade due to market forces, health concerns and clean-energy policies. Renewables surpass coal As a result of the shifts in generating capacity, solar generation has increased nearly tenfold over the last decade, while wind generation has doubled. As such, solar and wind reached 9% and 10% of the generation mix last year. Coal generation has fallen by more than 50% over the same period, replaced by a combination of renewables and gas, which has risen steadily.

16. Bill McKibben: Global ocean heat uptake.

“Global ocean heat uptake jumped by a staggering 23 zettajoules (ZJ) in 2025 alone. For context, 23 ZJ is roughly **200 times the total annual electricity generation of the entire human race**. The 2025 ocean heat uptake represents an eight-fold increase over the 1958–1985 annual mean baseline.”

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